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**STRUCTURAL GEOTECHNICAL REPORT**

**Briggs Street Bridge Over I-80**

**Existing SN 099-0216**

**Proposed SN 099-8307**

**Improvements and Reconstruction**

**IDOT Job No. P-91-185-09 / PTB 194-09**

**Joliet, Will County, IL**

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**JOB NO. 20012**

**January 10<sup>th</sup>, 2022  
Revised: May 12<sup>th</sup>, 2022  
Revised: July 25<sup>th</sup>, 2022**



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EXP US Services Inc.  
205 North Michigan Avenue, Suite 3600  
Chicago, Illinois 60601-5924

Attn: Mr. Thomas Hough, P.E.,  
Email: Thomas.Hough@exp.com

Job No. 20012

Re: Structure Geotechnical Report  
Briggs Street Bridge Over I-80 (Existing Bridge Structure No. 099-0216)  
Approximate Stationing: 59+04.84 to 61+17.09  
IDOT Job Number P-91-185-09 / PTB 194-09  
Joliet, Will County, Illinois

Dear Mr. Hough:

The following report presents the geotechnical analysis and recommendations for the proposed construction of the Briggs Street Bridge over westbound (WB) and eastbound (EB) Interstate 80 (I-80) between New Lenox Street (to the south of the bridge) and Mable Avenue (to the north of the bridge) in Will County, IL. The Briggs Street Bridge (Existing SN 099-0216) is a four-span structure with an overall length of 221.3-ft (back-to-back of abutment) and is 36-ft in width out-to-out of the deck. This bridge is to be replaced (Proposed SN 099-8307) with a two (2)-span continuous structure with an overall length of 210-ft (back-to-back of abutment) and a width of 82.25-ft (out-to-out of deck). The six (6) borings were completed at the site by Geo Services, Inc. (GEO). Copies of these boring logs, along with soil profiles, are included in this report.

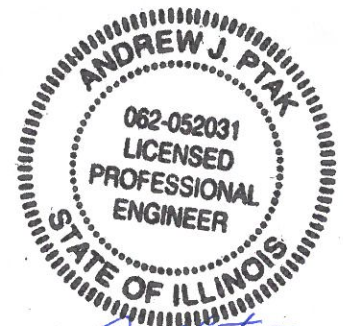
If there are any questions regarding the information submitted herein, please do not hesitate to contact us.

Very truly yours,

GEO SERVICES, Inc.

Samuel Plummer  
Project Manager

Andrew J. Ptak, P.E.  
Principal



enc.

*Ch. Ptak*  
e-PA 11/70/23

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## **SECTION 01: INTRODUCTION**

This report presents the results of the geotechnical investigation for the Briggs Street Bridge over EB/WB I-80 between New Lenox Street and Mable Avenue in Will County, IL. The results of the six (6) borings completed by Geo Services, Inc. (GEO) are included with this report. Two (2) soil borings are located along the proposed south abutment, two (2) are located along the proposed center pier in the median of I-80 and two (2) are located along the proposed north abutment. This report includes descriptions of soil and groundwater conditions, recommendations pertaining to the design and construction of foundations for the bridge abutments and pier, general construction considerations for the site, site location map, boring location diagram and boring logs.

## **SECTION 02: PROJECT DESCRIPTION**

The existing bridge (SN 099-0216) was built in 1965 and is a 4-span bridge with a total length (back-to-back abutment) of 221.3-ft and a width of 36-ft out-to-out of the deck. The new bridge (Proposed SN 099-8307) will consist of two (2)-span continuous structure with an overall length of 210-ft (back-to-back of abutment) and a width of 82.25-ft (out-to-out of deck). The approach slabs will also be replaced with standard 30-ft length pavements. The bridge is proposed to be supported on pile supported abutments (south and north) and a pile supported center pier.

The existing and proposed grade of the abutments and pier elevations are shown in the following **Table 1**:

**TABLE 1 – EXISTING GRADE ELEVATION AT ABUTMENTS**

<b>Location</b>	<b>Existing Ground Surface for Abutments &amp; Pier (Elevation)</b>	<b>Proposed Bottom of Abutment Elev. / Proposed Grade Elev. at Pier</b>
Northwest Abutment	658.6	651.65
Northeast Abutment	658.7	
Pier	637.7	638.01
Southwest Abutment	658.7	651.85
Southeast Abutment	658.9	



## **SECTION 03: SUBSURFACE INVESTIGATION PROCEDURES**

Boring locations were selected by GEO and were reviewed and approved by the EXP design team. Boring locations were laid out in the field by GEO personnel at the proposed locations. Elevations were taken using a survey grade GPS and can be seen on the boring logs.

The borings were performed on September 3<sup>rd</sup>, through September 15<sup>th</sup>, 2021 with a truck-mounted drilling rig and were advanced by means of hollow stem augers and rotary drilling techniques. Representative soil samples were obtained employing split spoon sampling procedures in accordance with AASHTO Method T-206. Samples obtained in the field were returned to GEO laboratory for further examination and testing.

Split spoon sampling involves driving a 2.0-in outside diameter split-barrel sampler into the soil with a 140-pound weight falling freely through a distance of 30-in. Blow counts are recorded at 6-in intervals and the blow counts are shown on the boring logs. The number of blows required to advance the sampler the last 12-in is termed the Standard Penetration Resistance (N). The N value is an indication of the relative density of the soil.

All split-spoon samples obtained from the drilling operation were visually classified in the field. Cohesive samples were tested for unconfined compressive strength using an IDOT modified RIMAC test device and/or calibrated penetrometer in the field.

Rock coring was performed by the dual tube method using NX size, 10-ft length core barrel seated approximately 2-ft into bedrock for all the six (6) soil brings on either side of the bridges (north and south side) and in the middle of the bridge width between EB/WB I-80 in the medium (east and west) of the bridge. The full length of the boring was cased using 3-in diameter casing which was seated approximately 6-in into bedrock to prevent cave-in of the boring while coring.

## **SECTION 04: LAB TESTING PROGRAM**

The test procedures were performed in accordance with test procedures discussed in the IDOT Geotechnical Manual. All split-spoon samples obtained from the drilling operation were visually classified in the field. Cohesive samples were tested for unconfined compressive strength using an IDOT modified RIMAC test device and/or calibrated penetrometer in the field.

The soil testing program included performing water content, density and either unconfined compression and/or calibrated penetrometer tests on the cohesive samples recovered. Water content tests were performed on the non-cohesive samples recovered. These tests were performed upon representative portions of the samples

obtained in the field. The results of the above testing, along with a visual classification of the material based upon both the Illinois textural classification and the AASHTO Soil Classification System, are indicated on the boring logs. Rock cores were analyzed for Rock Quality Designations (RQD), percent recovery and compressive strength, cores were photographed. All laboratory testing can be found in **Appendix F**.

## **SECTION 05: SUBSURFACE CONDITIONS**

The following sections provide general descriptions of the typical soil profile encountered at the proposed bridge abutments and pier. Specific soil conditions can be found in the boring logs located in the **Appendix D** of this SGR.

### **5.1 Soil and Groundwater Conditions**

Six (6) soil borings were drill along the Brigg Street Bridge to understand the subsoils in the project area for the bridge widening and reconstruction. Two (2) soil borings are located along the proposed south abutment (BSB-052 & BSB-053), two (2) are located along the proposed center pier in the median of I-80 (BSB-054 & BSB-055) and two (2) are located along the proposed north abutment (BSB-056 & BSB-057).

The soil borings indicate the subgrade has three (3) main layers. The surface layer with a thickness that ranges from 3-ft to 28-ft. The soil borings in the EB/WB I-80 median indicate a thinner fill layer than what the borings at the abutments show. These two (2) soil borings also show 1-ft to 3-ft of topsoil at the surface before the fill layer. The fill layers consist of 2-in to 1.5-ft of sand, gravel and stone at the top, then stiff to very stiff clay loam, clay to sandy clay loam fill loam that ranges in thickness of 2-ft to 27-ft. Underlying the fill layer is a stiff to hard silty clay loam to clay loam to clay. These clay layers are 4-ft to 19-ft thick. The last layers evident are medium dense to very dense silty loam to fractured rock and silty sand and gravel that ranges in thickness from 6.5-ft to 23-ft.

High moisture contents were observed in three (3) soil borings: BSB-053, BSB-056, and BSB-057. The moisture contents range from 30% to 34%. In BSB-053, the high moisture was observed at approximately 25-ft below grade (EL. 634). In BSB-056, the moisture contents vary in depth, 5-ft, 12-ft and 22-ft below existing grade (EL. 653.6, 646.6 & 636.6). In BSB-057, the high moisture content is observed at depth of 25-ft below grade (EL. 633.7). These high moistures are low enough and encountered deep enough that no remedial treatment is required for the reconstruction of the bridge.

All soil borings were terminated in bedrock. All bedrock was observed to be Silurian System, Niagaran Services Dolomite. A total rock core length of 15-ft was obtained at each of soil boring locations. The first run was obtained as 10-ft and the second run as a 5-ft run. All rock cores had a high percentage of recovery from 56% to 100%, with an average of 93.6%. However, the RQDs of the cores were very low, only 9% to 70%, with an average of 26.2% which is a designation of poor by RQD standards. **Table 2**

summarizes the percentage recovery, RQDs, and compressive strength of the cores from each soil boring location.

**TABLE 2 – ROCK CORE SUMMARY**

Boring(s)	Grade Elevation (ft)	No. of Run	Top of Bedrock Elevation (ft)	Depth of Run (ft)	Length of Core (ft)	Recovery (%)	RQD (%)	Compressive Strength (tsf)
BSB-052	658.8	1	606.8	56.0-66.0	10	100	40	304
		2		66.0-71.0	5	100	70	627
BSB-053	659.0	1	604.0	56.0-66.0	10	98	27	631
		2		66.0-71.0	5	100	40	946
BSB-054	637.3	1	605.3	32.0-42.0	10	98	36	616
		2		42.0-47.0	5	80	16	753
BSB-055	638.0	1	607.5	32.5-42.5	10	95	22	886
		2		42.5-47.5	5	56	9	794
BSB-056	658.6	1	607.6	53.0-63.0	10	100	21	809
		2		63.0-68.0	5	100	62	846
BSB-057	658.7	1	607.2	51.5-54.0	2.5	100	0	N/A
		2		54.0-62.0	8.5	90	32	775
		3		62.0-66.5	4.5	100	49	877

During drilling operation groundwater was encountered in only two (2) soil borings, BSB-054 and BSB-055, at approximate depths of 1.5-ft (EL 635.8) to 5-ft (EL. 633) respectively, with an average depth of 3.25-ft (EL. 634.4). Based on the coloration change of the soils from brown and gray to gray, the long-term water table is estimated to be at depths of 10.5-ft (EL. 627.5) to 42-ft (EL. 616.7), with an average depth of 28.5-ft (EL. 623.15). Fluctuations in the amount of water accumulated and in the hydrostatic water table can be anticipated depending upon variations in precipitation, and surface runoff. Due to the fact that the borings were drilled using mud rotary drilling technique, the 24-hour reading would not be meaningful for long term ground water table (GWT) elevation determination. Therefore, this reading was not taken.

## **SECTION 06: ANALYSES**

### **6.1 Coal Mine Activity**

According to readily available ISGS sources, The Illinois Coal Mine Maps for Will County indicate that an underground industrial mine and surrounding buffer region have taken place approximately 0.3-miles southwest of the project site vicinity. It is assumed that potential undermining exists at the locations of the industrial mining operations. However, the proposed construction will take place at the top of the embankment approximately 40-ft above surrounding ground surface elevation therefore will likely not impact underground mining operations. The Illinois Coal Mine Maps for Will County can be found in **Appendix I**.

### **6.2 Seismic Analysis**

The seismic parameters shown below were determined per AASHTO LRFD Bridge Design Specification Manual (2012). The project site is considered to be in a low seismic area and liquefiable layers and scour are not expected to impact the design of the new structure. We recommend that Site Classification C be used for seismic design based on site specific SPT tests, RIMAC tests, and the laboratory shear strength measurements of recovered soil samples. **Table 3 – Seismic Design** contains a summary of the seismic data to be used for design.

**TABLE 3  
 SEISMIC DESIGN (APPROXIMATELY 1000-YEAR RETURN PERIOD)**

Description	Type	Value
Long Term Horizontal Response Spectral Acceleration Coefficient (1.0 second period)	S <sub>1</sub>	0.040 g
Short Term Horizontal Response Spectral Acceleration Coefficient (0.2 second period)	S <sub>s</sub>	0.104 g
Design seismic value at 1 second	S <sub>D1</sub>	0.068 g
Design seismic value at 0.2 second	S <sub>Ds</sub>	0.125 g
Seismic Performance Zone	-	1
Site Class	-	C

IDOT Seismic Site Class Determination spreadsheet (from IDOT B.B.S. Foundations and Geotechnical Unit) was used to determine the seismic site class for the project site. Liquefiable layers are not expected to impact the design of retaining wall structure.

### **6.3 Settlement Analysis**

Using the soil conditions which indicate stiff to very stiff clay loam fill in the borings BSB-052 thru BSB-057, we calculate settlement to be minimal on the abutments (on both sides, north and south) with settlements under 0.50-in. The settlement calculations included that the fill embankment for the widening of the bridge will be approximately 25-ft in height. GEO assumes that the abutments and pier piles will extend to the top of rock.

### **6.4 Slope Stability Analysis**

Based on the slope stability analyses, the factor of safety (FOS) for both short-term (undrained) and long-term (drained) conditions are greater than 1.5 and meet the FOS requirements for a fill embankment per IDOT requirements. There are no slope stability concerns for the proposed center pier.

Graphical outputs are shown in **Appendix E** of this report. **Table 4** summarizes the global stability factor of safety (FOS) calculated for the short-term and long-term soil conditions of the proposed abutments.

**TABLE 4 – SUMMARY OF SLOPE STABILTY**

Soil Boring Used for Slope Stability Analysis <sup>1</sup>	Roadway Station Limits (Alignment)	Location on Bridge	Factor of Safety (FOS) <sup>2</sup>	
			Undrained Condition	Drained Condition
BSB-052	58+97	SW Corner	3.76	1.56
BSB-053	58+97	SE Corner	3.56	1.53
BSB-056	61+27	NW Corner	5.17	1.56
BSB-057	61+24	NE Corner	4.49	1.59

- Notes: 1. Boring used for Slope Stability Analysis was based on the apparent worst-case soil profile within the proposed roadway station limits.  
 2. STABL (v.3.0) – Bishop Method was used for Global Slope Stability analysis.

### **6.5 Bearing Capacity**

Proposed footing elevations at for the piers have been determined based on the TS&L plans provided by EXP. Bearing capacity calculations for the piles supporting the center pier used resistance factor of 0.45 has been used for the LRFD soil bearing capacity calculations assuming the footing is on bedrock. The piles supporting the abutments bearing calculations used a resistance factor of 0.5 for footing on clay. See pile calculations tables and graphs in **Appendix G**. GEO assumes both the abutments and pier piles shall be driving to the top of rock or refusal of the pile.

## **SECTION 07: RECOMMENDATIONS**

### **7.1 Deep Foundation H-Pile Recommendations**

Steel H-piles are the recommended option for the deep foundation system for the Briggs Street bridge structure. These steel H-piles should be according to AASHTO M270 Grade 50. Due to the presence of fractured rock below 25-ft to 45-ft depths, per the soil boring logs, pile shoes are recommended for pile driving. The results of the calculations for factored resistance available (FRA) and nominal required bearing (NRB) corresponding to various estimated pile lengths are shown in **Appendix G** of this report.

Based on the soil consistency and top of rock elevation profile, we recommend one test pile at the Northwest and Southwest corners of the proposed bridge. The piles should be driven until satisfactory driving resistance is developed in accordance with an appropriate pile driving formula. The test piles shall be driven to 110 percent of the Nominal Required Bearing indicated in the pile data information.

The pile size and capacity selected should be based on economic considerations and the loads imposed on the structures. Although the new bridge abutment widening areas have approximately 25-ft of new fill, we do not anticipate much settlement (0.5-in or less) and no downdrag on the piles needs to be accounted for in design. No downdrag on the piles is anticipated.

Regarding pile spacing, the minimum pile spacing should be 3 times the pile diameter. The maximum pile spacing should be limited to 3.5 times the effective footing thickness plus 1-ft and not exceeding 8-ft. This range for pile spacing is according to the IDOT Bridge Manual (2012) section 3.10.1.11. For piles placed in accordance with the aforementioned pile spacing, group effect should be ignored.

Please note that where the new pier overlaps the location of the existing pier the new piles will need to be spaced to miss the existing piles.

### **7.2 Approach Slab Recommendations**

The new approach slab will be supported on footings 10-in thick and level out to out per the IDOT Bridge Manual (2012) Article 3.2.12. The factored bearing resistance used for the calculations for the approach slab was 0.50 for footing on clay loam fill per AASHTO 4<sup>th</sup> Edition Article 10.5.5.2.2. For design of the approach slab footing (“sleeper slab”) system, the bearing soils should be considered to be the new embankment fill which should consist of an inorganic approved material, compacted to a minimum 95% of AASHTO T-99 (ASTM D-698), standard proctor method. Moisture levels for fill material should be maintained within a maximum +/- 3% of the optimal moisture content or as directed by the engineer. An experienced engineer should oversee the placement and compaction of embankment fill to ensure proper lift thickness, moisture content and densities are achieved in order to reduce the potential for settlement.

### **7.3 Embankment Recommendations**

The majority of the subgrade consists of silty clay/clay loam soils interstratified with sand/sandy clay loam/silty loam/sand, gravel and fractured rock soils. The new fill is expected to consist of cohesive and non-cohesive material. We recommend a shrinkage factor of 15% for cohesive or granular soils.

Settlement for the north and south abutments was calculated to be 0.5-in or less.

As the maximum settlement estimates are approximately under an inch of settlement, no hold time is needed after embankment is placed before paving.

Prior to placing any borrow fill at the site, it is recommended that the exposed surface at or near grade be proof-rolled with the heaviest available equipment to determine if there are any localized deposits of soft or unsuitable materials. During the proof-rolling procedure, the exposed surface is rolled with the heaviest piece of construction equipment available at the site, such as a heavily loaded tandem axle dump truck having a gross weight of not less than 25-tons. Any such deposits, as observed by deflection of the subgrade under the wheels of the proof-rolling equipment, should be removed and replaced with an approved fill free of organic matter and debris. The silt and silty clay loam soils are sensitive to moisture changes and some softening/disturbance of the exposed soils should be expected following periods of precipitation. If any remediation is required at the time of construction, it may include undercutting and placement of a stabilization stone such as IDOT gradation CA-1 or PGEs materials or approved fill material.

In addition, borrow and excavation material should be in accordance with Section 6.2 of the IDOT Geotechnical Manual.

Fill materials placed at the site should consist of an inorganic approved material, compacted to a minimum 95% of AASHTO T-99 (ASTM D-698), standard proctor method. Moisture levels for fill material should be maintained within a maximum +/- 3% of the optimal moisture content or as directed by the engineer.

Construction of the proposed roadway improvements should be performed in accordance with the current Illinois Department of Transportation (IDOT) 2022 Standard Specifications for Road and Bridge Construction and 2015 Geotechnical Manual. In particular, refer to Section 202, "Earth and Rock Excavation", Section 205, "Embankment" and Section 301, "Subgrade Preparation".

### **7.4 Lateral Resistance Recommendations**

For design of the lateral forces on the piles, the following tables may be used for design of the deep foundation system or temporary earth retaining systems.



**TABLE 5 – SOIL PARAMETERS FROM LATERAL EARTH  
 PRESSURES/RESISTANCE  
 North Abutment West Side (BSB-056) Sta. 61+27**

Material (Approx. Elevation, ft)	Unit Weight (pcf)	Undrained Friction Angle (°)	Undrained Cohesion (psf)	Drained Friction Angle (°)	Drained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci) <sup>1</sup>	Strain	K <sub>0</sub>	K <sub>A</sub>	K <sub>P</sub>
Stiff to Very Stiff Clay Loam (658 to 635)	125	0	2,200	28	0	700	0.006	0.5	0.39	2.6
Stiff Silty Clay (635 to 633)	120	0	1,300	26	0	375	0.008	0.5	0.39	2.6
Very Stiff to Hard Clay Loam (633 to 621)	130	0	5,200	28	0	1,700	0.004	0.5	0.39	2.6
Very Stiff Clay (621 to 616)	120	0	2,000	26	0	650	0.008	0.5	0.39	2.6
Medium Dense Silty Sand and Gravel (616 to 611)	125	30	--	30	0	90	--	0.5	0.33	3.0
Stiff Silty Clay (611 to 607)	120	0	1,000	28	0	200	0.009	0.5	0.36	2.8

Notes: 1. Values recommended for use in design from L-pile Software Manual.  
 2. Lateral earth pressure co-efficient as per AASHTO 3.11.5.8.  
 3. Top of bedrock is observed below EL. 607-ft.

**TABLE 6 – SOIL PARAMETERS FROM LATERAL EARTH  
 PRESSURES/RESISTANCE  
 North Abutment East Side (BSB-057) Sta. 61+24**

Material (Approx. Elevation, ft)	Unit Weight (pcf)	Undrained Friction Angle (°)	Undrained Cohesion (psf)	Drained Friction Angle (°)	Drained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci) <sup>1</sup>	Strain	K <sub>0</sub>	K <sub>A</sub>	K <sub>P</sub>
Medium Dense to Very Stiff FILL Clay Loam (658 to 648)	120	0	2,000	26	0	650	0.008	0.5	0.39	2.6
Medium Dense FILL Sandy Clay Loam (648 to 640)	125	30	--	30	0	90	--	0.5	0.31	3.3
Medium Dense to Very Stiff FILL Clay Loam (640 to 635)	120	0	2,250	26	0	750	0.006	0.5	0.39	2.6
Very Stiff Organic Silty Clay (635 to 633)	120	28	3,500	28	0	1,150	0.004	0.5	0.36	2.8
Very Stiff Clay Loam to Silty Clay to Clay (633 to 616)	120	0	2,250	26	0	750	0.006	0.5	0.39	2.6
Medium Dense Fracture Rock (616 to 611)	130	30	--	30	0	90	--	0.5	0.33	3.0
Medium Dense Gravel (611 to 607)	130	30	--	30	0	90	--	0.5	0.33	3.0

- Notes: 1. Values recommended for use in design from L-pile Software Manual.  
 2. Lateral earth pressure co-efficient as per AASHTO 3.11.5.8  
 3. Top of bedrock is observed below EL. 607-ft.

**TABLE 7 – SOIL PARAMETERS FROM LATERAL EARTH  
 PRESSURES/RESISTANCE  
 South Abutment West Side (BSB-052) Sta. 58+97**

Material (Approx. Elevation, ft)	Unit Weight (pcf)	Undrained Friction Angle (°)	Undrained Cohesion (psf)	Drained Friction Angle (°)	Drained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci) <sup>1</sup>	Strain	K <sub>0</sub>	K <sub>A</sub>	K <sub>P</sub>
Very Stiff to Hard FILL Clay Loam (658 to 630)	125	0	2,700	28	0	975	0.005	0.5	0.36	2.8
Stiff Silty Clay Loam (630 to 626)	120	0	1,500	28	0	500	0.007	0.5	0.36	2.8
Medium Dense Silty Loam (626 to 616)	120	30	--	30	0	60	--	0.5	0.33	3.0
Medium Dense to Dense Clayey Sand, Gravel & fractured Rock (616 to 606)	130	30	--	30	0	90	--	0.5	0.33	3.0

- Notes:
1. Values recommended for use in design from L-pile Software Manual.
  2. Lateral earth pressure co-efficient as per AASHTO 3.11.5.8
  3. Top of bedrock is observed to be at EL. 606-ft.

**TABLE 8 – SOIL PARAMETERS FROM LATERAL EARTH  
 PRESSURES/RESISTANCE  
 South Abutment East Side (BSB-053) Sta. 58+97**

Material (Approx. Elevation, ft)	Unit Weight (pcf)	Undrained Friction Angle (°)	Undrained Cohesion (psf)	Drained Friction Angle (°)	Drained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci) <sup>1</sup>	Strain	K <sub>0</sub>	K <sub>A</sub>	K <sub>P</sub>
Stiff to Very Stiff Sandy Clay Loam to Clay Loam (659 to 633)	120	0	1,700	28	0	600	0.006	0.5	0.36	2.8
Stiff Silty Clay (633 to 631)	120	0	1,700	28	0	600	0.006	0.5	0.36	2.8
Very Stiff Clay Loam (631 to 627)	120	0	2,000	28	0	650	0.008	0.5	0.36	2.8
Medium Dense Silty Loam (627 to 617)	120	32	--	32	0	60	--	0.5	0.31	3.3
Very Stiff Clay (617 to 612)	120	0	2,000	28	0	650	0.008	0.5	0.36	2.8
Very Dense Fractured Rock (612 to 604)	135	32	--	32	0	125	--	0.5	0.33	3.0

- Notes: 1. Values recommended for use in design from L-pile Software Manual.  
 2. Lateral earth pressure co-efficient as per AASHTO 3.11.5.8  
 3. Top of bedrock is observed to the EL. 604-ft

**TABLE 8 – SOIL PARAMETERS FROM LATERAL EARTH  
 PRESSURES/RESISTANCE  
 Middle Pier Location (BSB-054 & BSB-055) Sta. 60+11**

Material (Approx. Elevation, ft)	Unit Weight (pcf)	Undrained Friction Angle (°)	Undrained Cohesion (psf)	Drained Friction Angle (°)	Drained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci) <sup>1</sup>	Strain	K <sub>0</sub>	K <sub>A</sub>	K <sub>P</sub>
Stiff to Very Stiff Sandy Clay Loam to Clay Loam (659 to 633)	120	0	1,700	28	0	600	0.006	0.5	0.36	2.8
Stiff Silty Clay (633 to 631)	120	0	1,700	28	0	600	0.006	0.5	0.36	2.8
Very Stiff Clay Loam (631 to 627)	120	0	2,000	28	0	650	0.008	0.5	0.36	2.8
Medium Dense Silty Loam (627 to 617)	120	32	--	32	0	60	--	0.5	0.31	3.3
Very Stiff Clay (617 to 612)	120	0	2,000	28	0	650	0.008	0.5	0.36	2.8
Very Dense Fractured Rock (612 to 606)	135	32	--	32	0	125	--	0.5	0.33	3.0

Notes: 1. Values recommended for use in design from L-pile Software Manual.  
 2. Lateral earth pressure co-efficient as per AASHTO 3.11.5.8  
 3. The average top of bedrock is observed to the EL. 606-ft. Top of bedrock is observed to be 605-ft for BSB-054 and 607-ft for BSB-055

## **SECTION 08: CONSTRUCTION CONSIDERATIONS**

IDOT temporary sheet pile wall design tables may not be used for temporary soil retention, and the designer should inform the contractor for the need of a temporary soil retention system.

During excavation for the proposed improvements, movement of adjacent soils into the excavation should be prevented. All excavations should be performed in accordance with the latest Occupational Safety and Health Administration (OSHA) requirements. Allowances should be made for any surcharge loads adjacent to the retaining structures.

We anticipate the groundwater level to be typically below the pier footings, and that typically sump pump and pit procedures should keep the site in the dry.

Please note that where the new pier overlaps the location of the existing pier the new piles will need to be spaced to miss the existing piles.

## **SECTION 09: GENERAL QUALIFICATIONS**

The analysis and recommendations presented in this report are based upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations that may occur between borings or across the site. In addition, the soil samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations. The nature and extent of such variations may not become evident until construction. If variations appear evident, it will be necessary to reevaluate the recommendations of the report. In addition, it is recommended that Geo Services Inc. be retained to perform construction observation and thereby provide a complete professional geotechnical engineering service through the observational method.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are intended or made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer. Also note that Geo Services Inc. is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of the report's subsurface data or engineering analyses without the express written authorization of Geo Services Inc.

**APPENDIX A**  
**GENERAL NOTES**



## GENERAL NOTES

### CLASSIFICATION

American Association of State Highway & Transportation Officials (AASHTO) System used for soil classification.

#### Cohesionless Soils

<u>Relative Density</u>	<u>No. of Blows per foot N</u>
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	Over 50

#### TERMINOLOGY

**Streaks** are considered to be paper thick. **Lenses** are considered to be less than 2 inches thick. **Layers** are considered to be less than 6 inches thick. **Stratum** are considered to be greater than 6 inches thick.

#### Cohesive Soils

<u>Consistency</u>	<u>Unconfined Compressive Strength - qu (tsf)</u>
Very Soft	Less than 0.25
Soft	0.25 - 0.5
Medium Stiff	0.5 - 1.0
Stiff	1.0 - 2.0
Very Stiff	2.0 - 4.0
Hard	Over 4.0

### DRILLING AND SAMPLING SYMBOLS

SS: Split Spoon 1-3/8" I.D., 2" O.D.	HS: Housel Sampler
ST: Shelby Tube 2" O.D., except where noted	WS: Wash Sample
AS: Auger Sample	FT: Fish Tail
DB: Diamond Bit - NX: BX: AX	RB: Rock Bit
CB: Carboloy Bit - NX: BX: AX	WO: Wash Out
OS: Osterberg Sampler	

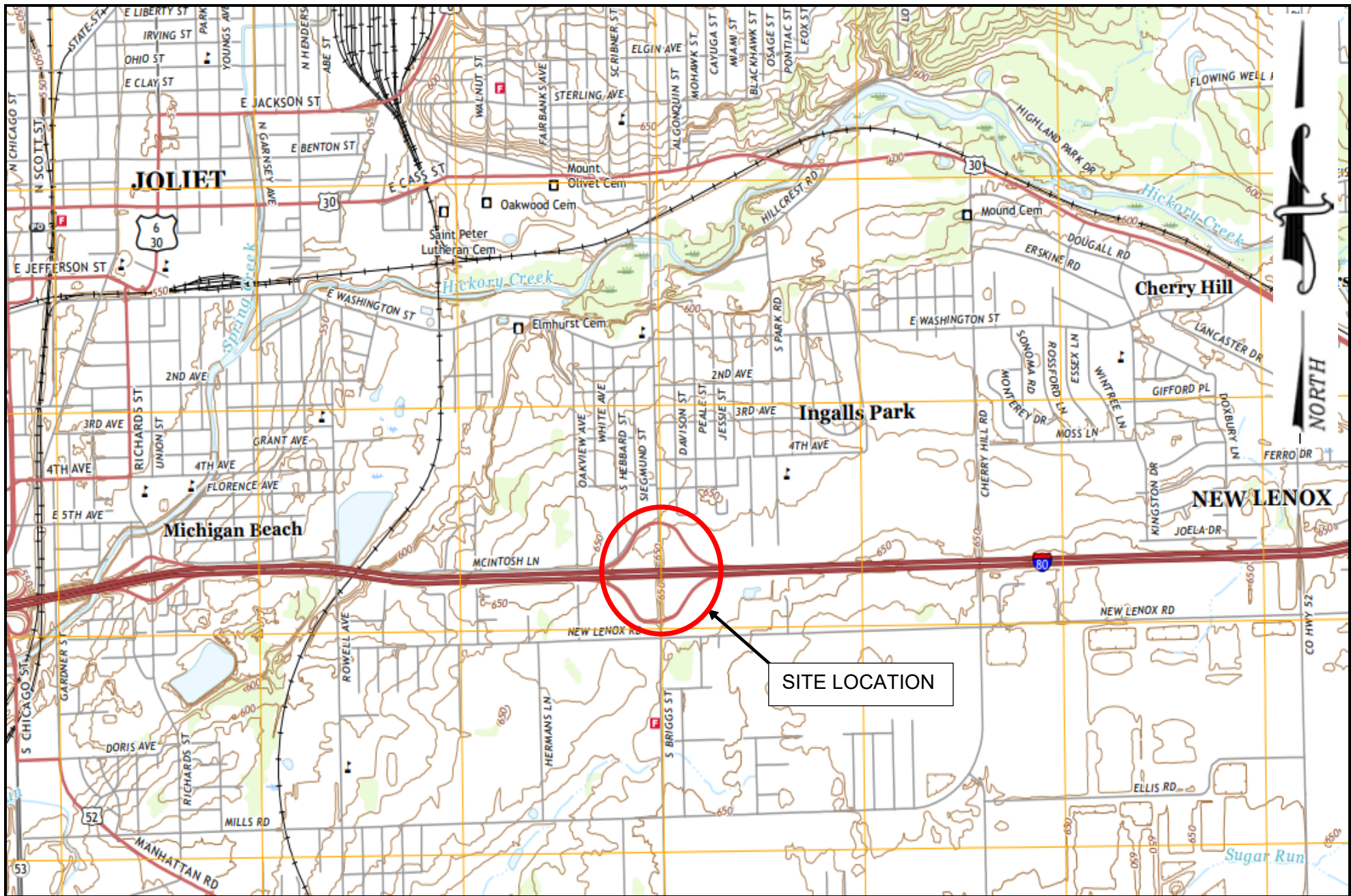
Standard "N" Penetration: Blows per foot of a 140 lb. hammer falling 30" on a 2" O.D. Split Spoon


### WATER LEVEL MEASUREMENT SYMBOLS

WL: Water	WD: While Drilling
WCI: Wet Cave In	BCR: Before Casing Removal
DCI: Dry Cave In	ACR: After Casing Removal
WS: While sampling	AB: After Boring

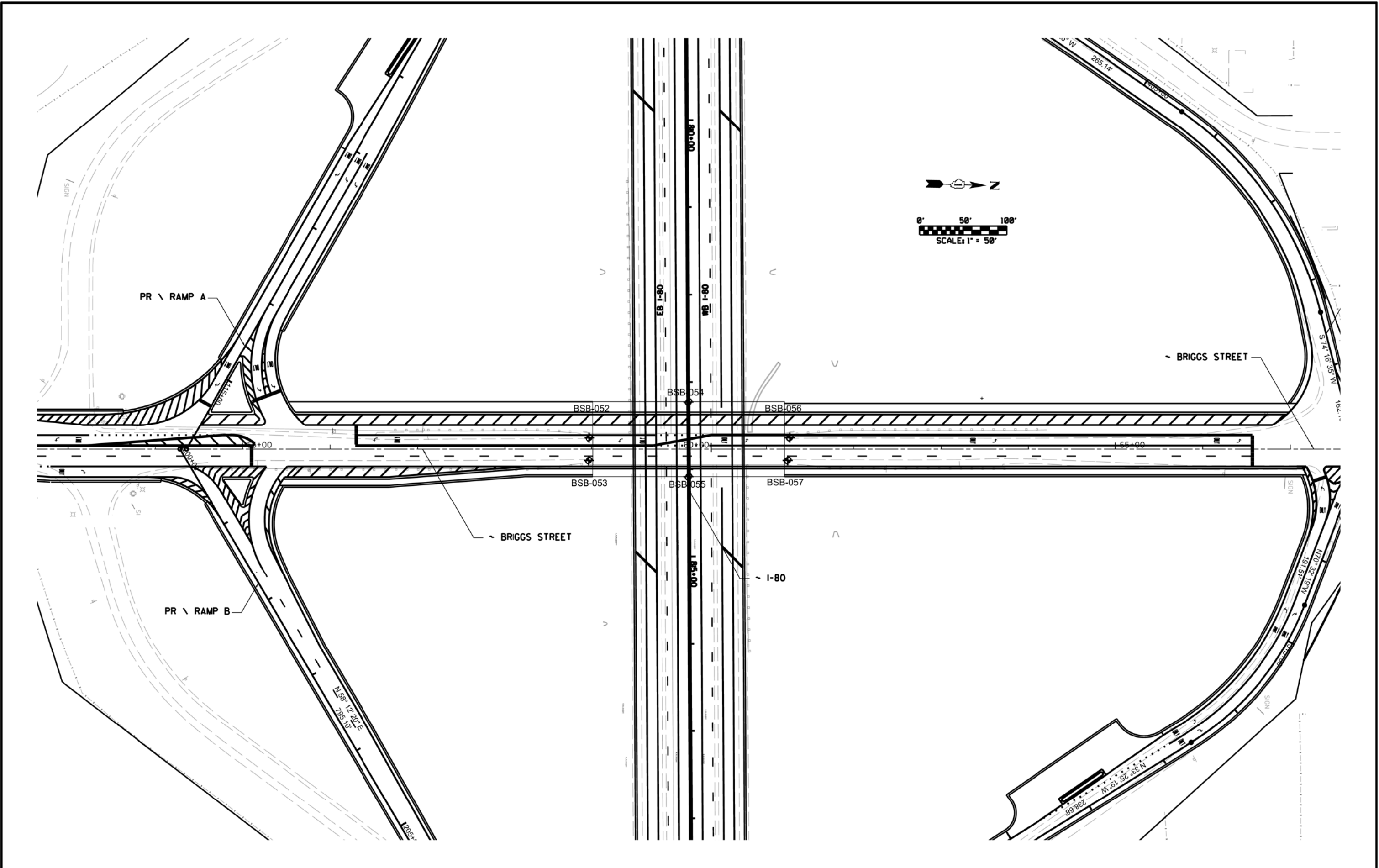
Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils, the accurate determination of ground water elevations is not possible in even several days observation, and additional evidence on ground water elevations must be sought.

**APPENDIX B**  
**SITE LOCATION MAP**



SITE LOCATION MAP	 <p><b>Geo Services, Inc.</b> Geotechnical, Environmental &amp; Civil Engineering 805 Amherst Court, Suite 204 Naperville, Illinois 60565 (630) 355-2838</p>	DRAWN BY	AGW
GEOTECHNICAL RECOMMENDATION		APPROVED BY	AJP
Briggs Street Bridge over I-80		DATE	September 10, 2021
Improvements & Reconstruction		GEO JOB No.	20012
Will County, Joliet, IL		SCALE	NTS

**APPENDIX C**  
**BORING LOCATION PLAN & PROFILE**

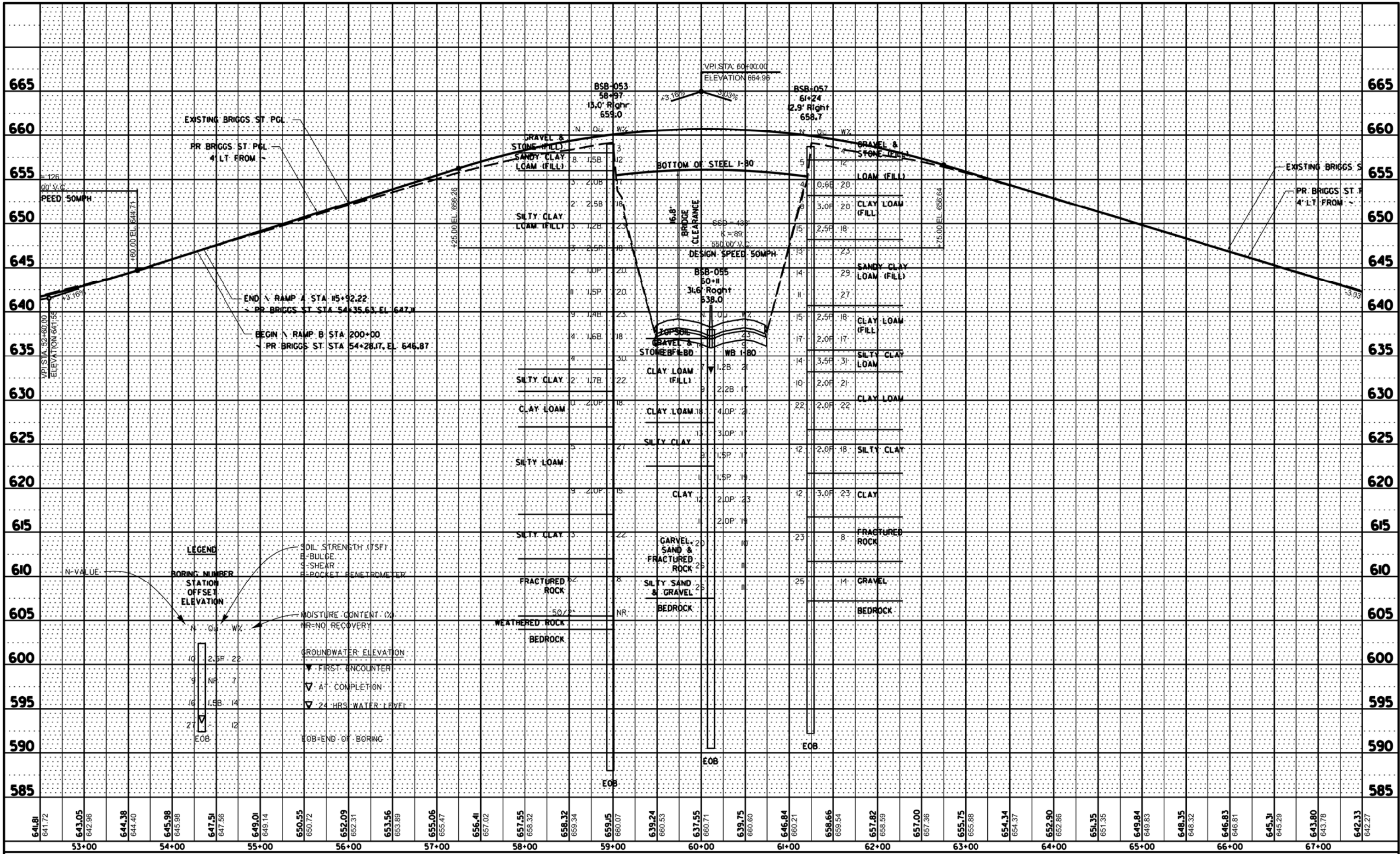


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#FILE#		DRAWN - RWC	REVISED -					#TOTAL #BRI-2		
	PLOT SCALE = #SCALE#	CHECKED - AJP	REVISED -						CONTRACT NO.	
	PLOT DATE = #DATE#	DATE - #DATE	REVISED -			SCALE: 1" = 50'	SHEET #BRI-20F #BRI-TOT	STA. 54+00 TO STA. 67+00	ILLINOIS FED. AID PROJECT	



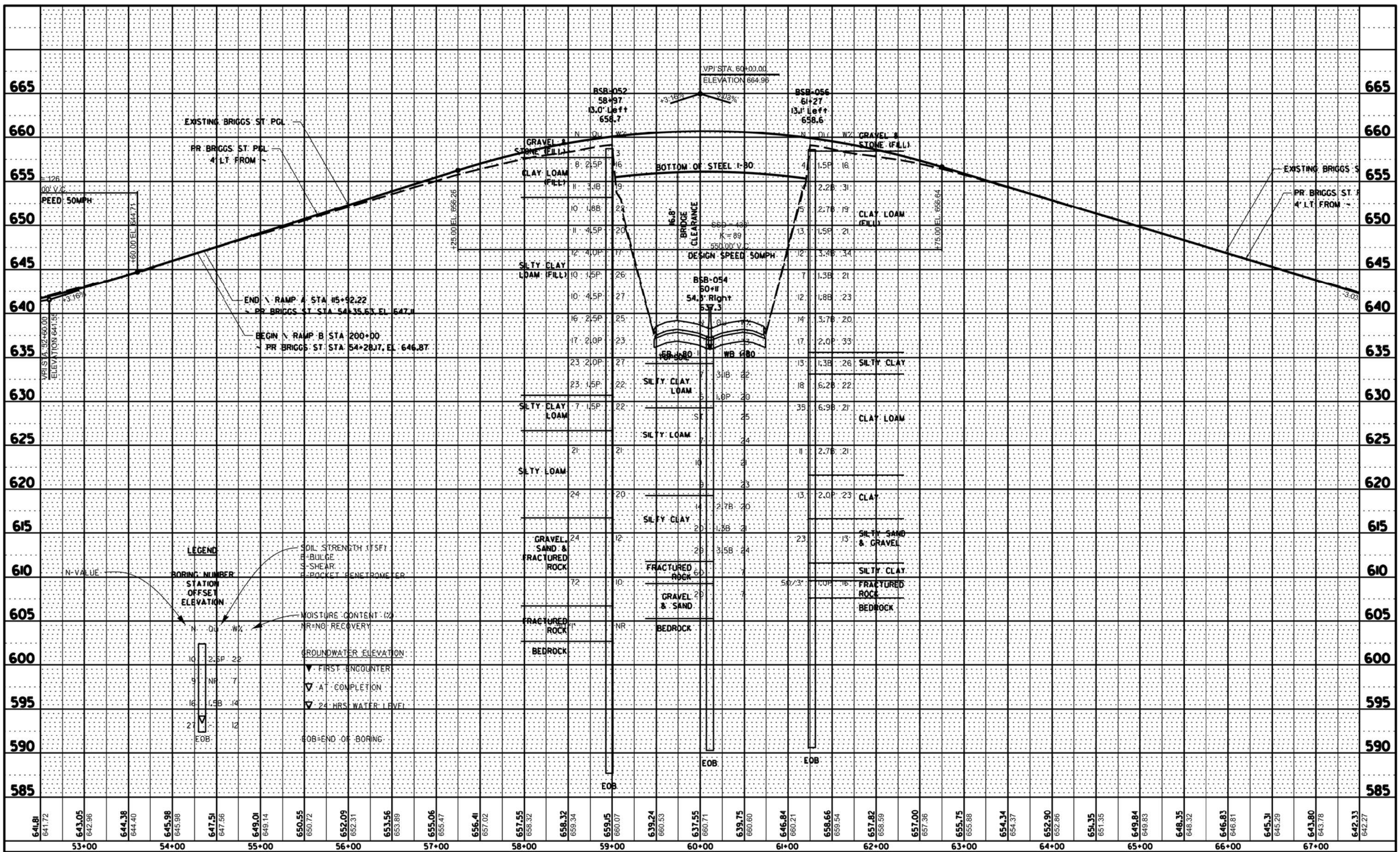
DATE	
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	NO. OF
	DATE
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	NAME

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PROFILE	SURVEYED
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	PLOTTED
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	NO. OF
	DATE
	FILE
	NAME



PLAN SURVEYED BY DATE  
 CHECKED BY DATE  
 ALIGNED BY DATE  
 RT. OF WAY CHECKED BY DATE  
 PAID FILE NAME

PROFILE SURVEYED BY DATE  
 CHECKED BY DATE  
 GRADES CHECKED BY DATE  
 B.M. NOTED BY DATE  
 STRUCTURE NOTATIONS CHFD



FILE NAME =	USER NAME = #USER#	DESIGNED - AT	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	
#FILE#		CHECKED - AJP	REVISED -				#TOTAL	#BRI-2	
Geo Services, Inc.	PLOT SCALE = #SCALE#	DRAWN - RWC	REVISED -		SCALE: -	SHEET #BRI-2 OF #BRI-TOT	STA. 50+00 TO STA. 65+00	FED. ROAD DIST. NO.	ILLINOIS FED. AID PROJECT
	PLOT DATE = #DATE#	CHECKED - #DATE	REVISED -		CONTRACT NO.				



**APPENDIX D**  
**BORING LOGS**

# SOIL BORING LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

CLIENT	D E P T H  (ft)	B L O W S  (/6")	U C S  Qu (tsf)	M O I S T  (%)	D I S T R I B U T I O N D E N S I T Y  (pcf)	Surface Water Elev.						D E P T H  (ft)	B L O W S  (/6")	U C S  Qu (tsf)	M O I S T  (%)	D I S T R I B U T I O N D E N S I T Y  (pcf)		
						ft	Stream Bed Elev.	ft	Groundwater Elev.:	First Encounter	ft	Upon Completion	ft	After - Hrs.	ft			
BORING NO. <u>BSB-052</u>						<u>n/a</u>												
Northing <u>1765202</u>						<u>n/a</u>												
Easting <u>1063842</u>						<u>Dry to -10.0'</u>												
Ground Surface Elev. <u>658.8</u> ft						<u>n/a</u>												
SAND, GRAVEL & STONE-dark brown & gray	657.8			3														
CLAY LOAM-dark brown & gray spotted black-stiff to hard (Fill)		3										4						
		3	2.50	16								8	2.00	23				
		5	P									9	P					
		4										6						
		5	3.10	19								13	2.00	27				
		6	B									10	P					
	-5											-25						
		3										8						
		4	1.80	22								12	1.50	22				
		6	B									11	P					
		3																
		4	4.50	20									4	1.50	22			
		7	P									3	P					
	-10											-30						
		4																
		4	4.00	17														
		8	P															
		3																
		3	1.50	26									8		21			
		7	P										13					
	-15												-35					
		4																
		6	4.50	27														
		4	P															
		5																
		7	2.50	25									6					
		9	P										10		20			
	-20												14					
													-40					

Z:\PROJECTS\2020\20012 EXP. I-80 FROM CHICAGO ST. TO RT 30, PTB 194-9\20012 BORING LOGS\20012\_LOG.GPJ 9/20/21

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
 The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206), GP-Geoprobe Hand Auger  
 BBS, from 137 (Rev. 8-99)





# ROCK CORE PHOTO

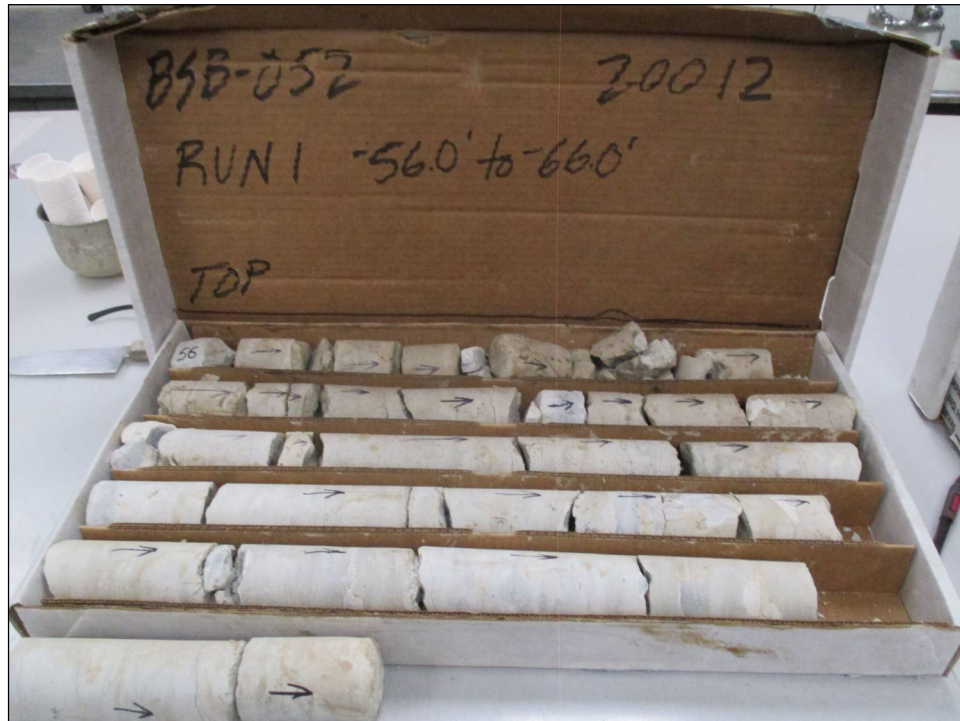
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-052 Core Diameter 2 in  
 Northing 1765202 Top of Rock Elev. 602.8 ft  
 Easting 1063842 Begin Core Elev. 602.8 ft  
 Ground Surface Elev. 658.8 ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

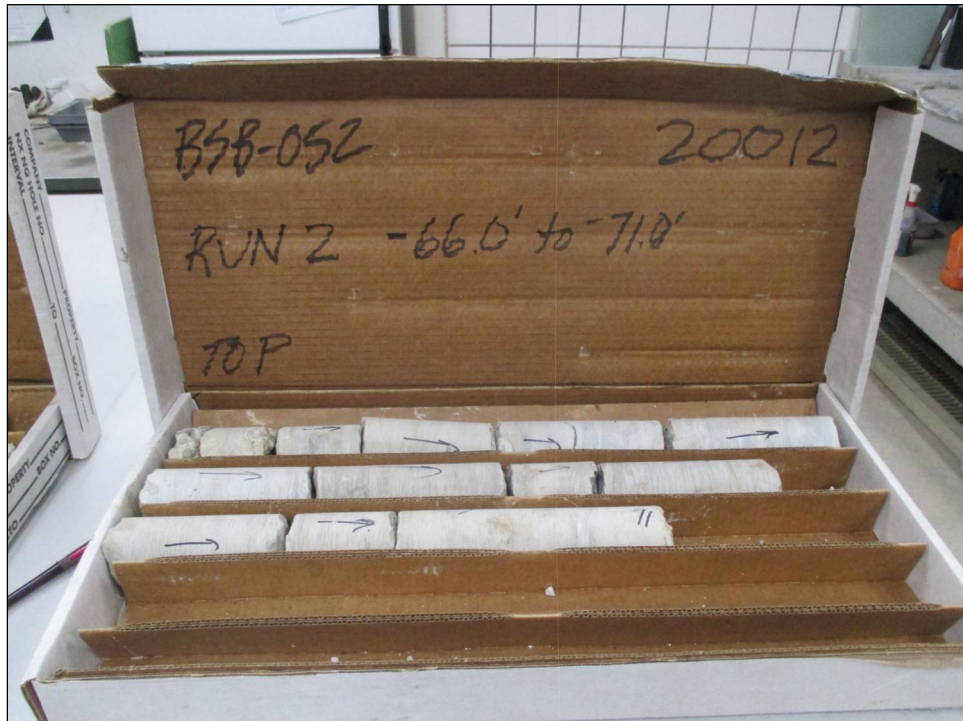
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO.	<u>BSB-052</u>	Core Diameter	<u>2</u>	in
Northing	<u>1765202</u>	Top of Rock Elev.	<u>602.8</u>	ft
Easting	<u>1063842</u>	Begin Core Elev.	<u>602.8</u>	ft
Ground Surface Elev.	<u>658.8</u>			ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# SOIL BORING LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

CLIENT	D E P T H  (ft)	B L O W S  (/6")	U C S  (tsf)	M O I S T  (%)	D I L L I N G D I S T I C E N C E S  (pcf)	Surface Water Elev. _____ n/a ft	D E P T H  (ft)	B L O W S  (/6")	U C S  (tsf)	M O I S T  (%)	D I L L I N G D I S T I C E N C E S  (pcf)
BORING NO. <u>BSB-053</u>						Stream Bed Elev. _____ n/a ft					
Northing <u>1765202</u>						Groundwater Elev.:					
Easting <u>1063868</u>						First Encounter <u>Dry to -10.0'</u> ft					
Ground Surface Elev. <u>659.0</u> ft						Upon Completion _____ n/a ft					
						After - Hrs. _____ - ft					

SAND, GRAVEL & STONE-gray (Fill)	658.0			3		CLAY LOAM-dark brown & gray spotted black-stiff to very stiff (Fill) (continued)					
SANDY CLAY LOAM with Stone-dark brown, gray & black-stiff (Fill)	656.0	2		12			6				
		3	1.50				6	1.60	18		
		5	B				8	B			
CLAY LOAM-dark brown & gray spotted black-stiff to very stiff (Fill)		4					4				
		6	2.00	17			6		30		
		7	B				8				
		-5				633.5	-25				
		4				SILTY CLAY-dark gray to black-stiff					
		5	2.50	18			5				
		7	B				6	1.70	22		
							6	B			
		3				631.0					
		6	1.20	23		CLAY LOAM-brown & gray-very stiff					
		7	B				3				
		-10					5	2.00	18		
							5	P			
		4					-30				
		6	2.50	18							
		7	P			627.0					
						SILTY LOAM-brown & gray-medium dense					
		4									
		5	1.00	20			5				
		7	P				7		27		
		-15					8				
		4					-35				
		5	1.50	20							
		6	P								
		4									
		8	1.40	23			8				
		11	B				11	2.00	15		
		-20					8	P			
							-40				

Z:\PROJECTS\2020\20012 EXP. I-80 FROM CHICAGO ST. TO RT 30, PTB 194-9\20012 BORING LOGS\20012 LOG.GPJ 9/20/21

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
 The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206), GP-Geoprobe Hand Auger BBS, from 137 (Rev. 8-99)







# ROCK CORE LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. <u>BSB-053</u>	Core Diameter <u>2</u> in	D E P T H  (ft)	C O R E  (#)	R E C O V E R Y  (%)	R · Q · D ·  (%)	C O R E T I M E  (min/ft)	S T R E N G T H  (tsf)
Northing <u>1765202</u>	Top of Rock Elev. <u>603.95</u> ft						
Easting <u>1063868</u>	Begin Core Elev. <u>602.95</u> ft						
Ground Surface Elev. <u>659.0</u> ft							

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R·Q·D (%)	CORE TIME (min/ft)	STRENGTH (tsf)
RUN 1 (-56.0' to -66.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray & weathered with horizontal to wavy bedding. Weathered with numerous horizontal fractures throughout. Cherty with some rust staining,	603.0	1	98	27		
	-60					
	-65					
	593.0					
RUN 2 (-66.0' to -71.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray & fine grained with horizontal bedding. Numerous horizontal fractures throughout.		2	100	40		
	-70					
	588.0					
End Of Boring @ -71.0'. Boring backfilled with cuttings.						
	-75					

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

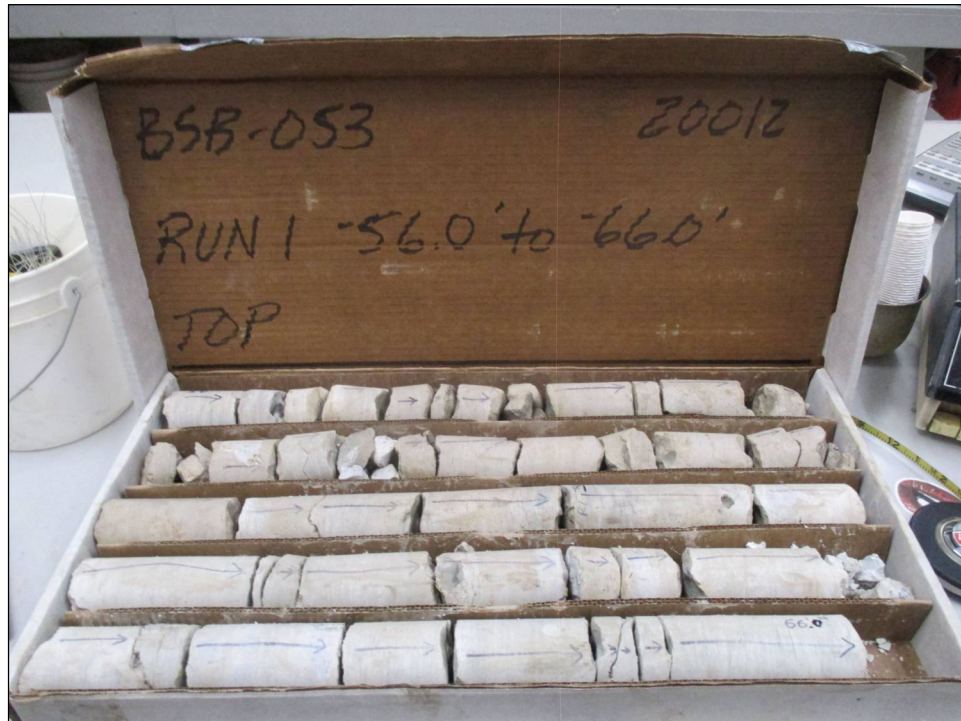
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-053 Core Diameter 2 in  
 Northing 1765202 Top of Rock Elev. 604.0 ft  
 Easting 1063868 Begin Core Elev. 603.0 ft  
 Ground Surface Elev. 659.0 ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

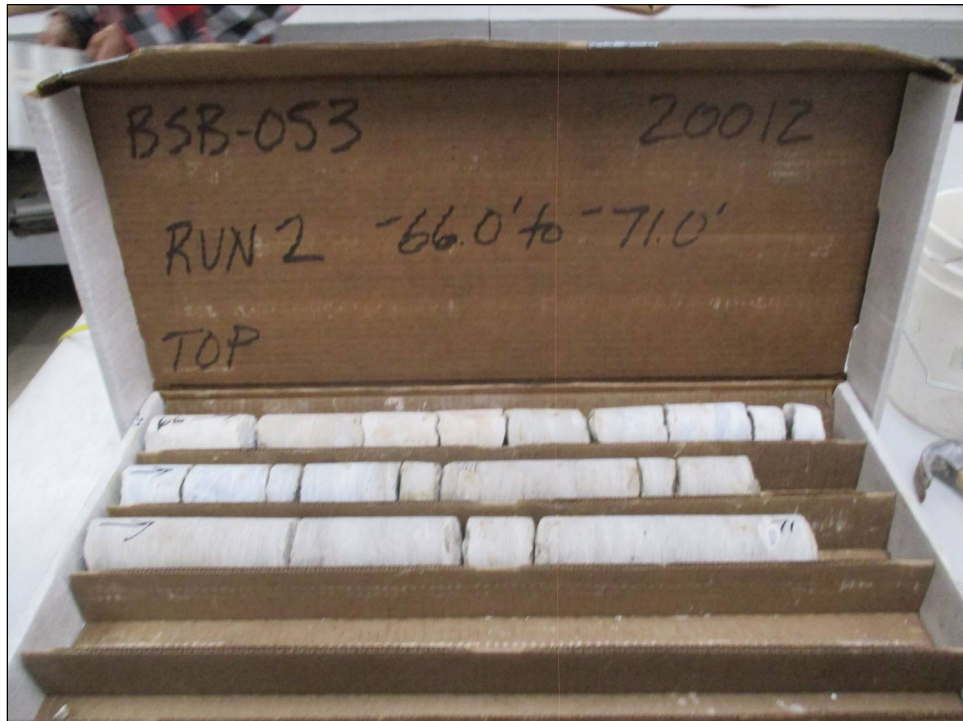
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO.	<u>BSB-053</u>	Core Diameter	<u>2</u>	in
Northing	<u>1765202</u>	Top of Rock Elev.	<u>604.0</u>	ft
Easting	<u>1063868</u>	Begin Core Elev.	<u>603.0</u>	ft
Ground Surface Elev.	<u>659.0</u>			ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)





# ROCK CORE LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-054 Core Diameter 2 in  
 Northing 1765314 Top of Rock Elev. 605.32 ft  
 Easting 1063798 Begin Core Elev. 605.32 ft  
 Ground Surface Elev. 637.3 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
RUN 1 (-32.0' to -42.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray & fine grained with horizontal bedding. Some rust staining to -37.0'. Cherty with numerous horizontal fractures throughout.	605.3	1	98	36		
	-35					
	-40					
	595.3					
RUN 2 (-42.0' to -47.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray & fine grained with horizontal bedding. Cherty with numerous horizontal fractures throughout.		2	80	16		
	-45					
	590.3					
End Of Boring @ -47.0'. Boring backfilled with cuttings.						
	-50					

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

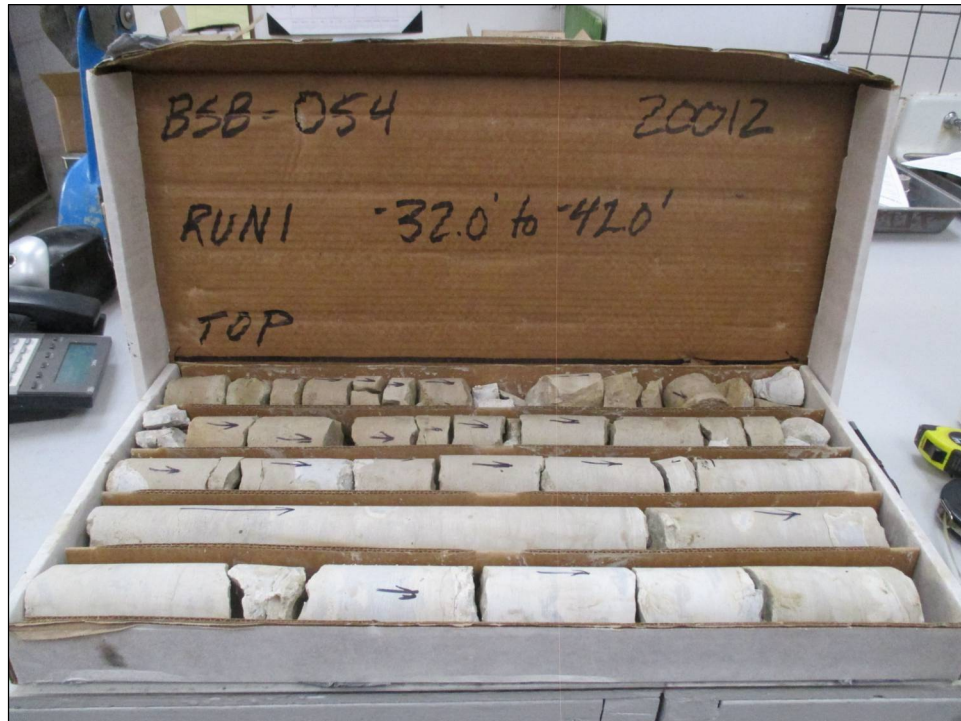
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-054 Core Diameter 2 in  
 Northing 1765314 Top of Rock Elev. 605.3 ft  
 Easting 1063798 Begin Core Elev. 605.3 ft  
 Ground Surface Elev. 637.3 ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)



# ROCK CORE PHOTO

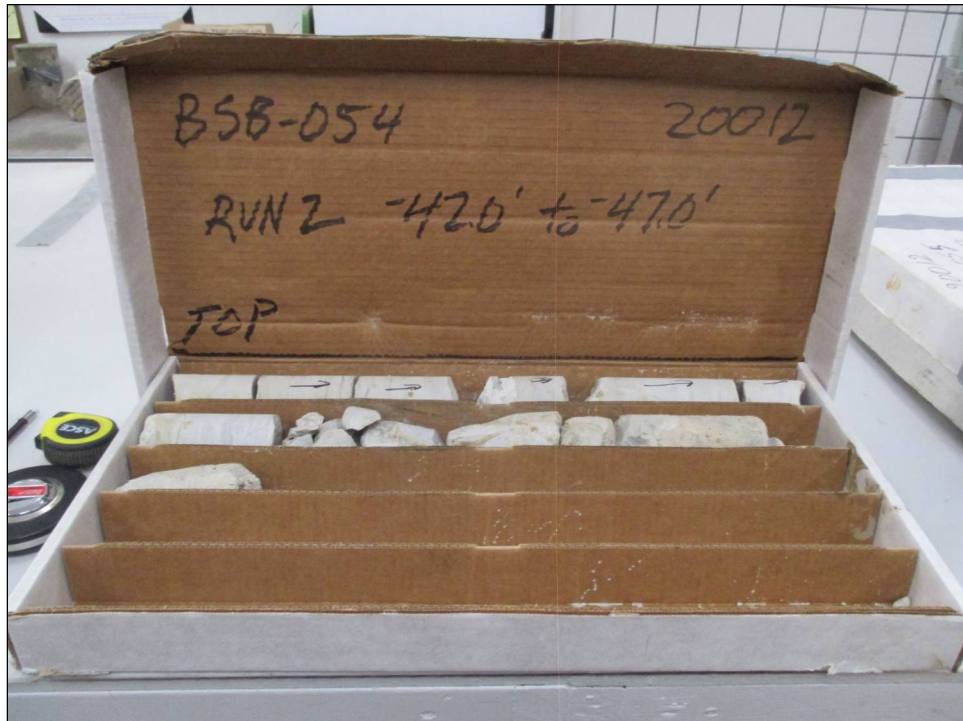
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO.	<u>BSB-054</u>	Core Diameter	<u>2</u>	in
Northing	<u>1765314</u>	Top of Rock Elev.	<u>605.3</u>	ft
Easting	<u>1063798</u>	Begin Core Elev.	<u>605.3</u>	ft
Ground Surface Elev.	<u>637.3</u>			ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)



# SOIL BORING LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

CLIENT	DEPTH H S	BLOW S Qu	UCS T	MOIST T	DENSITY DENSITY (pcf)	Surface Water Elev.	DEPTH								
						n/a ft	H	S	Qu	T	DENSITY				
BORING NO. <u>BSB-055</u>						Stream Bed Elev. <u>n/a</u> ft									
Northing <u>1765316</u>						Groundwater Elev.:									
Easting <u>1063884</u>						First Encounter <u>633.0</u> ft ▼									
Ground Surface Elev. <u>638.0</u> ft						Upon Completion <u>n/a</u> ft									
						After - Hrs. <u>-</u> ft									
TOPSOIL-black	637.0			23		CLAY-gray-stiff to very stiff (continued)									
SAND, GRAVEL & STONE-medium dense (Fill)		10						3							
		10		9				4	2.00	19					
		4						7	P						
	635.0														
CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)						FRACTURED ROCK-gray-medium dense									
		2						10							
		3	1.20	21				11		10					
		4	B					9							
		4													
		3	2.20	17				12							
		6	B					14		11					
	630.0														
CLAY LOAM-brown-hard		4				SILTY SAND & GRAVEL-gray-medium dense									
		8	4.00	21				17							
		10	P					15		11					
		-10													
	627.5														
SILTY CLAY-gray-stiff to very stiff		8				Drillers Observation: Apparent Bedrock									
		5	3.00	17											
		8	P												
		4				Borehole continued with rock coring.									
		3	1.50	17											
		6	P												
		-15													
	622.5														
CLAY-gray-stiff to very stiff		3													
		4	1.50	19											
		7	P												
		4													
		5	2.00	23											
		7	P												
		-20													

Z:\PROJECTS\2020\20012 EXP. I-80 FROM CHICAGO ST. TO RT 30, PTB 194-9\20012 BORING LOGS\20012\_LOG.GPJ 9/20/21

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
 The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206), GP-Geoprobe Hand Auger  
 BBS, from 137 (Rev. 8-99)



# ROCK CORE LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-055 Core Diameter 2 in  
 Northing 1765316 Top of Rock Elev. 607.50 ft  
 Easting 1063884 Begin Core Elev. 605.50 ft  
 Ground Surface Elev. 638.0 ft

DEPTH (ft)	CORE (#)	RECOVER (%)	R.Q. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
605.5	1	95	22		
-35					
-40					
595.5					
	2	56	9		
-45					
590.5					
-50					

RUN 1 (-32.5' to -42.5')  
 SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE  
 Light gray to gray & fine grained with horizontal bedding. Some rust staining to -37.5'.  
 Cherty with numerous horizontal fractures throughout. Highly fractured to -37.9'

RUN 2 (-42.5' to -47.5')  
 SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE  
 Light gray to gray & porous with horizontal bedding. Cherty with numerous horizontal  
 & vertical fractures throughout.

End Of Boring @ -47.5'. Boring backfilled with cuttings.

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-055 Core Diameter 2 in  
 Northing 1765316 Top of Rock Elev. 607.5 ft  
 Easting 1063884 Begin Core Elev. 605.5 ft  
 Ground Surface Elev. 638.0 ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

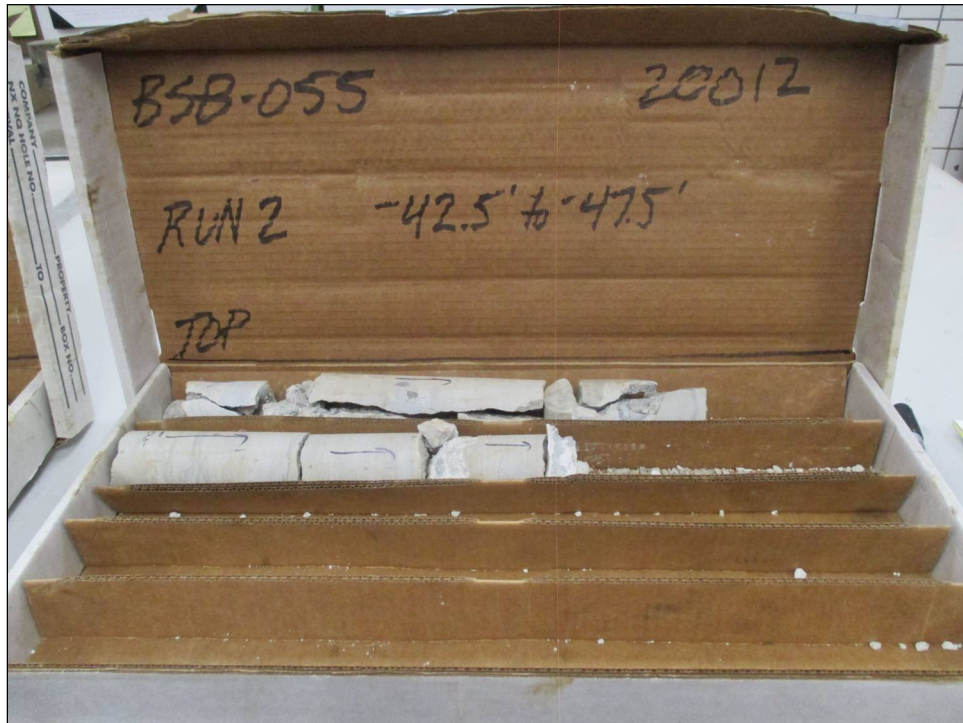
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO.	<u>BSB-055</u>	Core Diameter	<u>2</u>	in
Northing	<u>1765316</u>	Top of Rock Elev.	<u>607.5</u>	ft
Easting	<u>1063884</u>	Begin Core Elev.	<u>605.5</u>	ft
Ground Surface Elev.	<u>638.0</u>			ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# SOIL BORING LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

CLIENT	D E P T H  (ft)	B L O W S  (/6")	U C S  Qu (tsf)	M O I S T  (%)	D Y S I M I L I T Y  (pcf)	Surface Water Elev.						D E P T H  (ft)	B L O W S  (/6")	U C S  Qu (tsf)	M O I S T  (%)	D Y S I M I L I T Y  (pcf)	
						ft	Stream Bed Elev.	ft	Groundwater Elev.:	First Encounter	ft	Upon Completion	ft	After - Hrs.	ft		
BORING NO. <u>BSB-056</u> Northing <u>1765431</u> Easting <u>1063836</u> Ground Surface Elev. <u>658.6</u> ft																	
	2.0" SAND, GRAVEL & STONE-black	658.4			7												
CLAY LOAM-dark brown & gray spotted black-stiff to very stiff (Fill)		2										5					
		1	1.50	16								7	2.00	33			
	3	P										10	P				
						635.6											
SILTY CLAY-dak brown & black-stiff		1										4					
		1	2.20	31								6	1.30	26			
	3	B										7	B				
	-5					633.1						-25					
CLAY LOAM-brown & gray-very stiff to hard		6										4					
		7	2.70	19								7	6.20	22			
	8	B										11	B				
	4											6					
	7	1.50	21									15	6.90	21			
	6	P										20	B				
	-10											-30					
	4																
	6	3.40	34														
	6	B															
	3											2					
	3	1.30	21									5	2.70	21			
	4	B										6	B				
	-15											-35					
	4																
	5	1.80	23														
	7	B															
						621.6											
CLAY-gray-very stiff																	
		4										3					
	7	3.70	20									7	2.00	23			
	7	B										6	P				
	-20											-40					

Z:\PROJECTS\2020\20012 EXP. I-80 FROM CHICAGO ST. TO RT 30, PTB 194-9\20012 BORING LOGS\20012\_LOG.GPJ 9/20/21

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
 The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206), GP-Geoprobe Hand Auger  
 BBS, from 137 (Rev. 8-99)





# ROCK CORE LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-056 Core Diameter 2 in  
 Northing 1765431 Top of Rock Elev. 607.58 ft  
 Easting 1063836 Begin Core Elev. 605.58 ft  
 Ground Surface Elev. 658.6 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
RUN 1 (-53.0' to -63.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray & fine grained with horizontal bedding. Weathered & highly fractured with rust staining to -59.5'. Numerous chert nodules throughout.	605.6	1	100	21		
	-55					
	-60					
	595.6					
RUN 2 (-63.0' to -68.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray & fine grained with horizontal bedding. Numerous horizontal fractures throughout with some chert nodules.		2	100	62		
	-65					
	590.6					
End Of Boring @ -68.0'. Boring backfilled with cuttings.	-70					

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

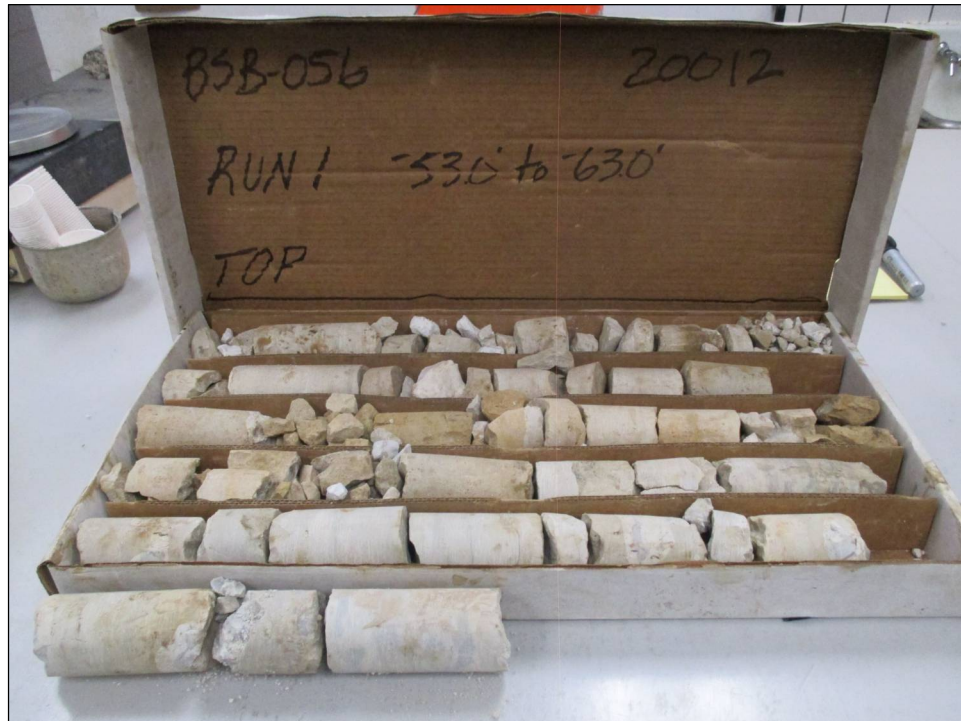
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-056 Core Diameter 2 in  
 Northing 1765431 Top of Rock Elev. 607.6 ft  
 Easting 1063836 Begin Core Elev. 605.6 ft  
 Ground Surface Elev. 658.6 ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)



# ROCK CORE PHOTO

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO.	<u>BSB-056</u>	Core Diameter	<u>2</u>	in
Northing	<u>1765431</u>	Top of Rock Elev.	<u>607.6</u>	ft
Easting	<u>1063836</u>	Begin Core Elev.	<u>605.6</u>	ft
Ground Surface Elev.	<u>658.6</u>			ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# SOIL BORING LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

CLIENT	DEPTH H S	BLOW S Qu	UCS T	MOIST S T	DENSITY T	Surface Water Elev.	DEPTH H S	BLOW S Qu	UCS T	MOIST S T	DENSITY T	
						ft						ft
BORING NO. <u>BSB-057</u>	Northing <u>1765429</u>	Easting <u>1063862</u>	Ground Surface Elev. <u>658.7</u> ft	(ft)	(/6")	(tsf)	(%)	(pcf)	Surface Water Elev. <u>n/a</u> ft	Stream Bed Elev. <u>n/a</u> ft	Groundwater Elev.:	
									First Encounter <u>Dry to -10.0'</u> ft	Upon Completion <u>n/a</u> ft	After - Hrs. <u>-</u> ft	
SAND, GRAVEL & STONE-medium dense (Fill)				4								
	657.2	1										
	CLAY LOAM with Gravel & Stone-dark brown, gray & black-loose (Fill)	3		12								
		2										
	655.7											
	CLAY LOAM-dark brown & gray spotted black-medium stiff to stiff (Fill)	1										
		2	0.60	20								
		2	B									
		-5										
		2										
CLAY LOAM-brown-very stiff (Fill) <i>(continued)</i>	4											
	7	2.00	17									
	10	P										
	635.7											
	ORGANIC SILTY CLAY-black-very stiff	4										
6		3.50	31									
8		P										
633.2												
CLAY LOAM-brown & gray-very stiff	4											
	5	2.00	21									
	5	P										
	7											
SANDY CLAY LOAM with Gravel-brown-medium dense (Fill)	11	2.00	22									
	11	P										
	-30											
648.2												
SILTY CLAY-gray-very stiff	6											
	6	23										
	7											
	5											
	6	29										
-15												
CLAY-gray-very stiff	4											
	5	27										
	6											
621.7												
CLAY LOAM-brown-very stiff (Fill)	4											
	6	2.50	18									
	9	P										
	-20											

Z:\PROJECTS\2020\20012 EXP. I-80 FROM CHICAGO ST. TO RT 30, PTB 194-9\20012 BORING LOGS\20012\_LOG.GPJ 9/20/21

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
 The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206), GP-Geoprobe Hand Auger  
 BBS, from 137 (Rev. 8-99)





# ROCK CORE LOG

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. <u>BSB-057</u>	Core Diameter <u>2</u> in	D E P T H  (ft)	C O R E  (#)	R E C O V E R Y  (%)	R Q U A L I T Y  (%)	C O R E T I M E  (min/ft)	S T R E N G T H  (tsf)
Northing <u>1765429</u>	Top of Rock Elev. <u>607.15</u> ft						
Easting <u>1063862</u>	Begin Core Elev. <u>607.15</u> ft						
Ground Surface Elev. <u>658.7</u> ft							

RUN 1 (-51.5' to -54.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal to wavy bedding. Weathered with rust staining. Highly fractured throughout with some chert nodules.	607.2	1	100	0		
	604.7					
RUN 2 (-54.0' to -62.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal to wavy bedding. Weathered with rust staining to -57.0'. Highly fractured throughout with some chert nodules.		2	90	32		
	-55					
	-60					
	596.7					
RUN 3 (-62.0 to -66.5') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal to wavy bedding. Some horizontal fractures throughout with some chert nodules.		3	100	49		
	-65					
	592.2					
End Of Boring @ -66.5'. Boring backfilled with cuttings.						
	-70					

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

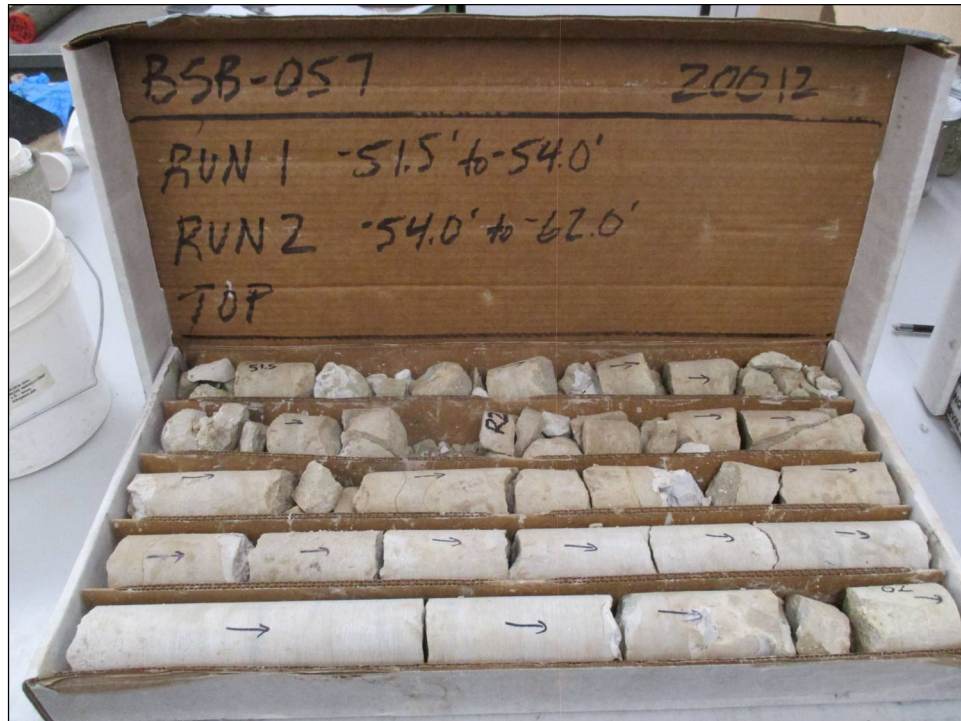
PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-057  
 Core Diameter 2 in  
 Northing 1765429  
 Top of Rock Elev. 607.2 ft  
 Easting 1063862  
 Begin Core Elev. 607.2 ft  
 Ground Surface Elev. 658.7 ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

# ROCK CORE PHOTO

PROJECT FAI 80

LOCATION I-80 from Chicago Street to US Route 30

COUNTY Will CORING METHOD Rotary Wash

CLIENT \_\_\_\_\_ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

BORING NO. BSB-057 Core Diameter 2 in  
 Northing 1765429 Top of Rock Elev. 607.2 ft  
 Easting 1063862 Begin Core Elev. 607.2 ft  
 Ground Surface Elev. 658.7 ft



Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

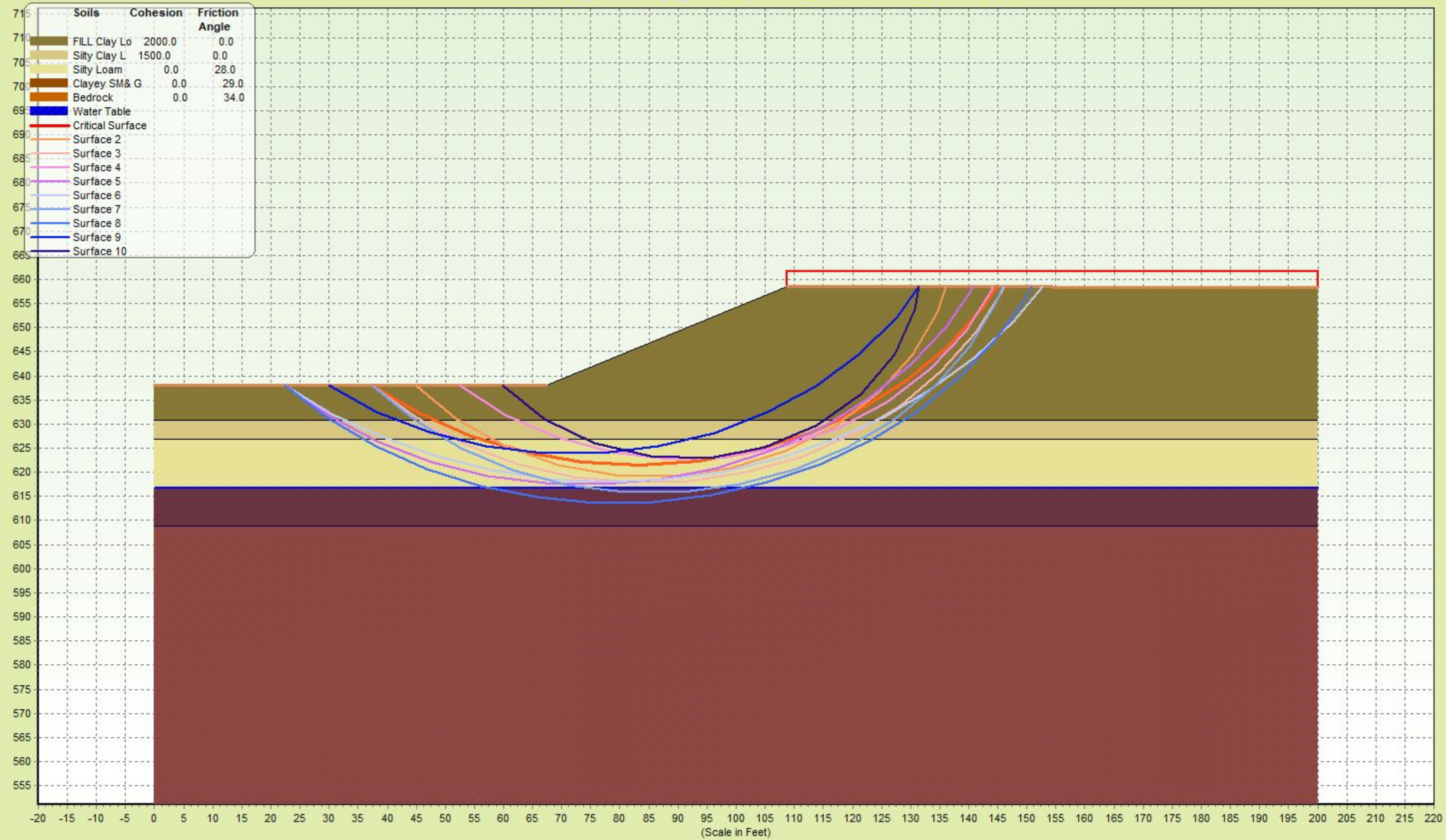
The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

## **APPENDIX E**

### **SLOPE STABILITY OUPUT (STABL)**

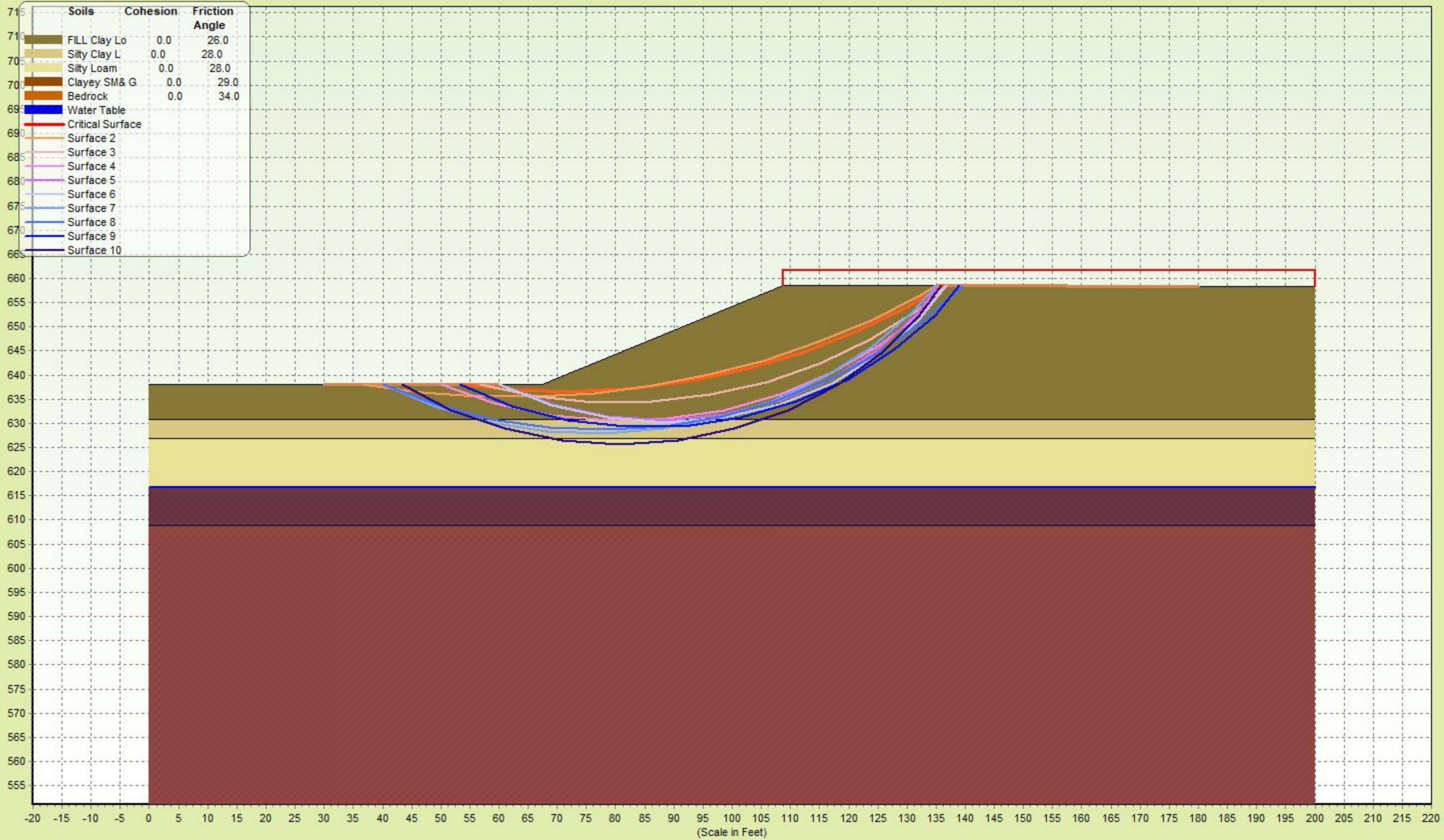


Problem: 20012: Briggs St. Bridge\_Undrained BSB-052 - FS Min- Bishop = 3.76

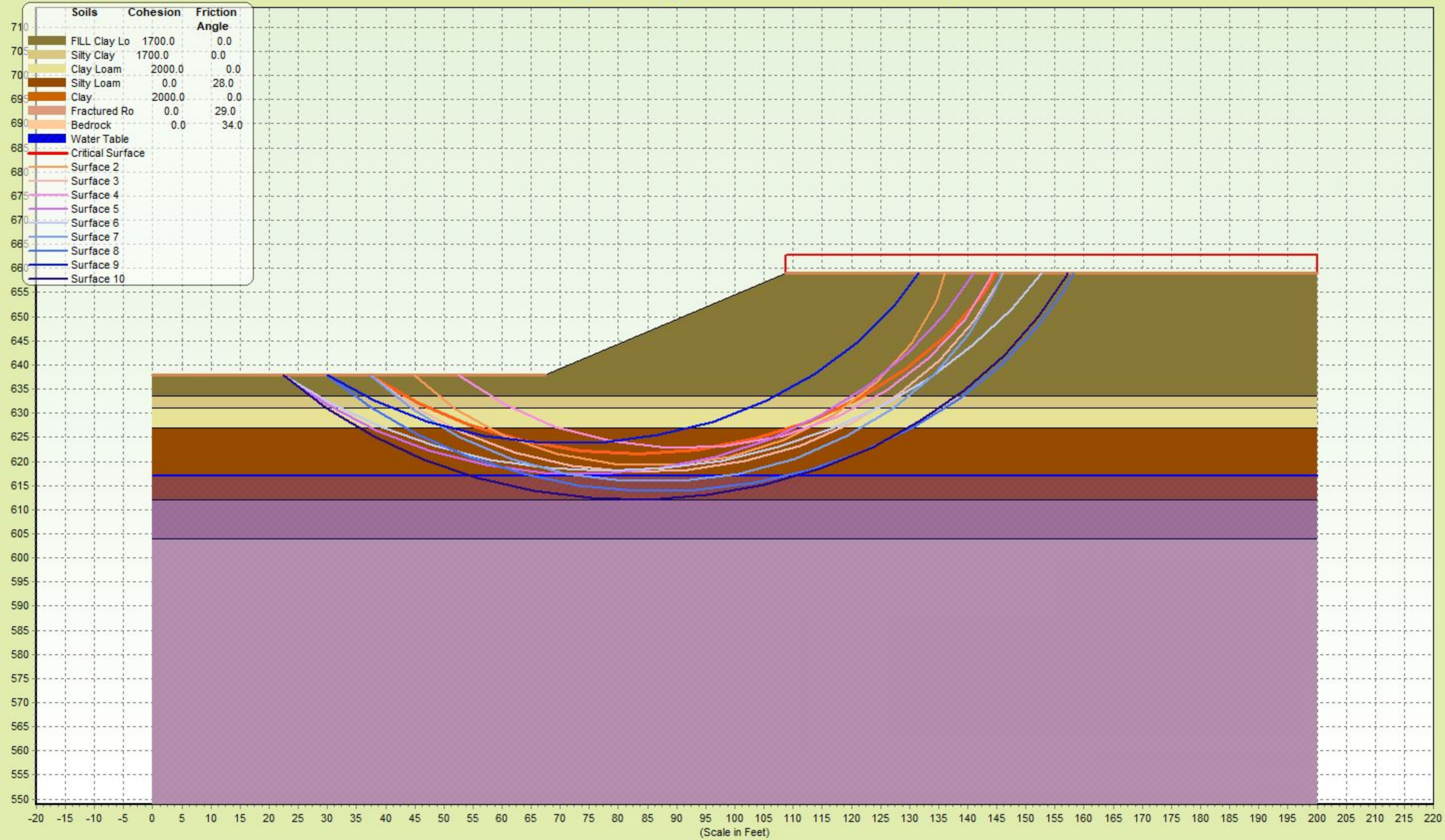




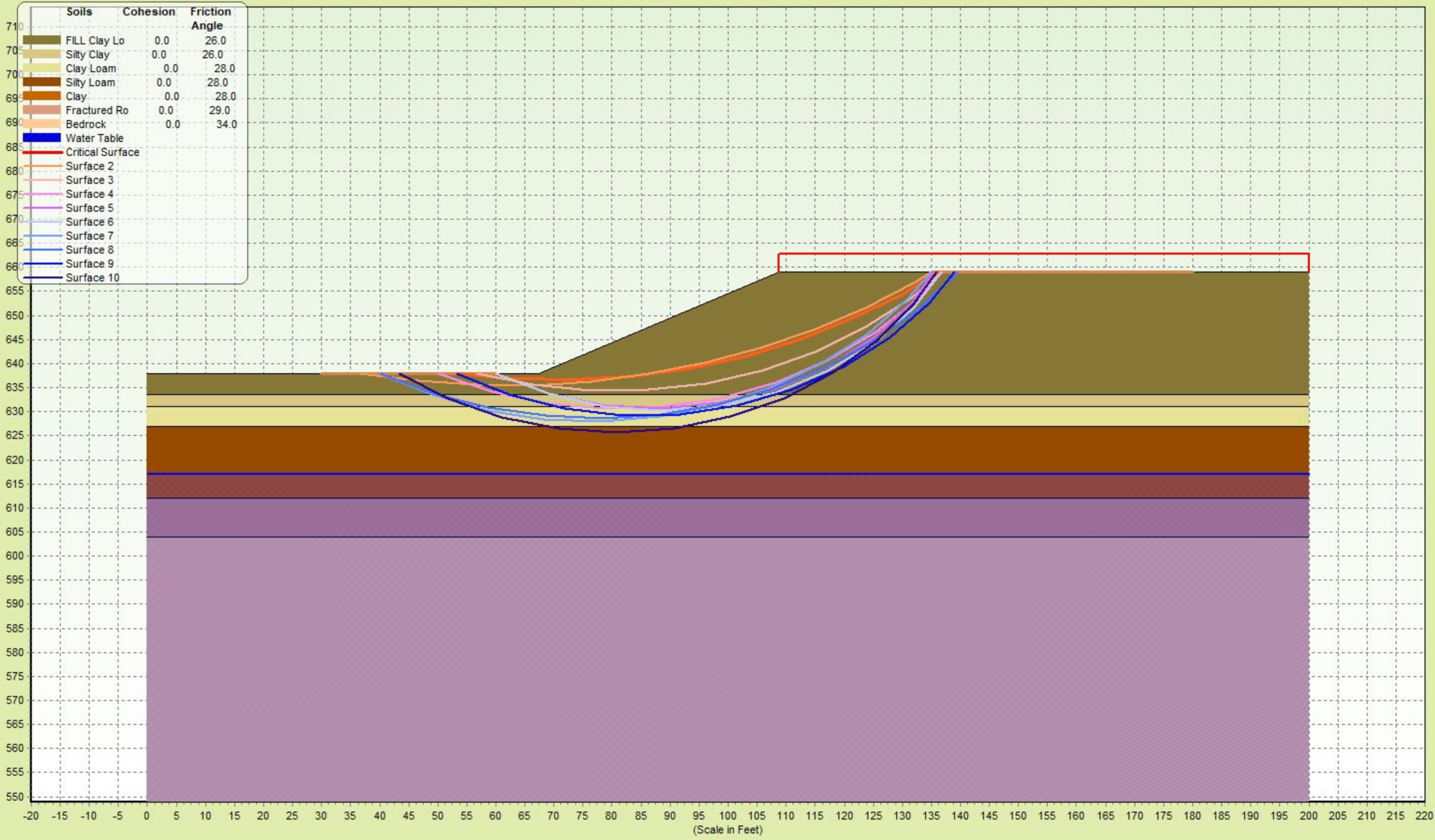
Problem: 20012: Briggs St. Bridge\_Drained BSB-052 - FS Min- Bishop = 1.561



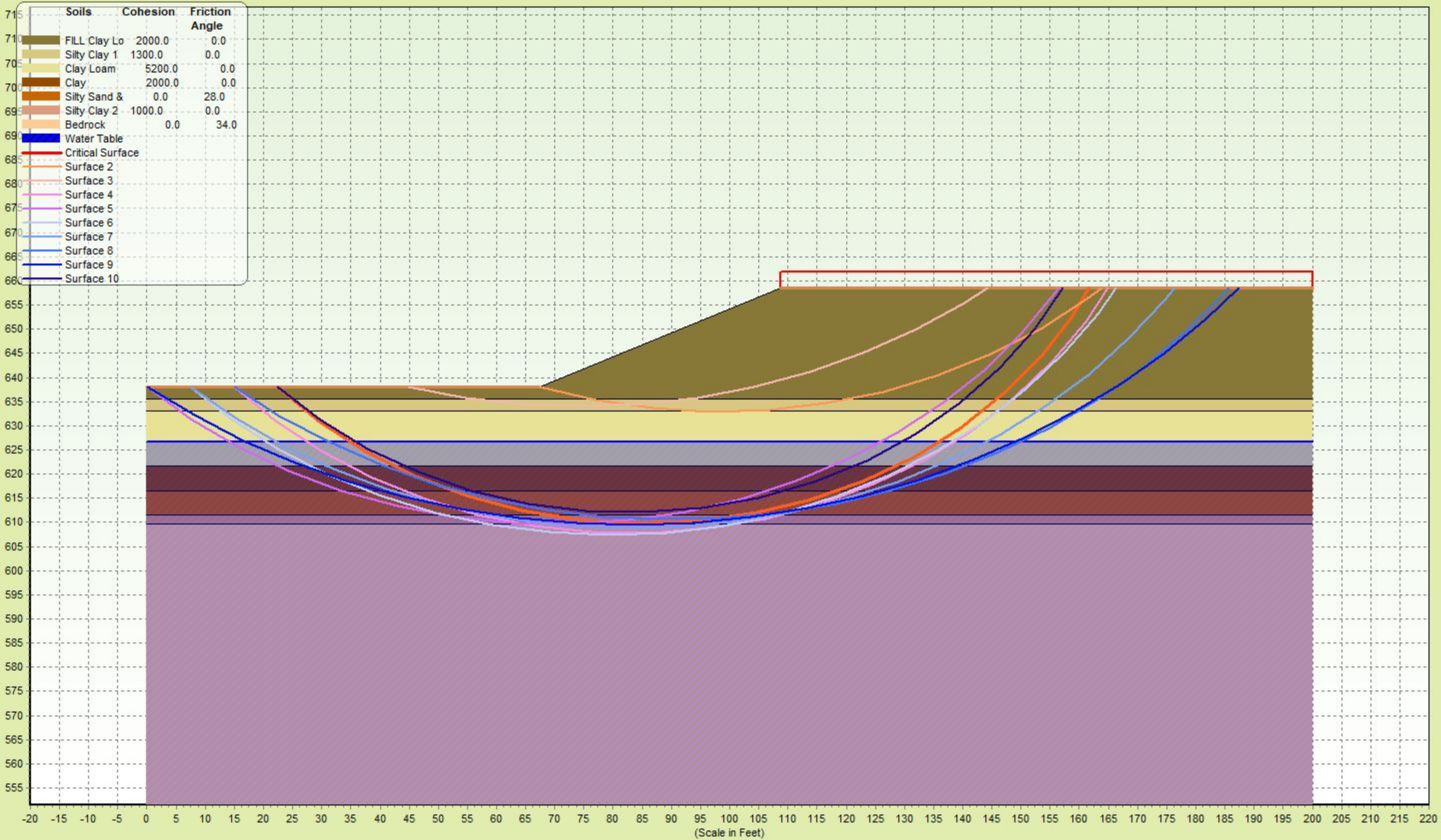
Problem: 20012: Briggs St. Bridge\_Undrained BSB-053 - FS Min- Bishop = 3.557





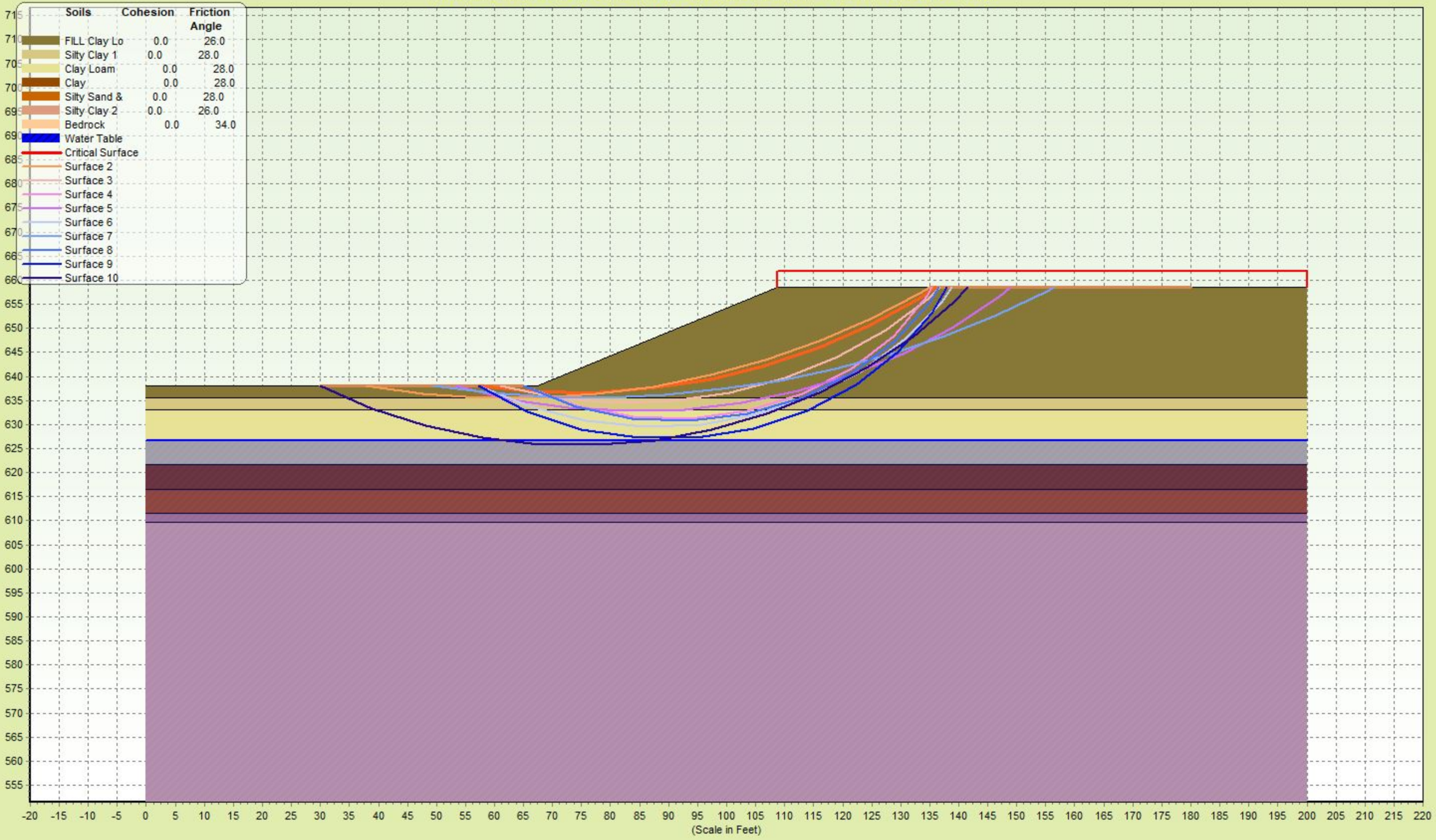


Problem: 20012: Briggs St. Bridge\_Undrained BSB-056 - FS Min- Bishop = 5.166

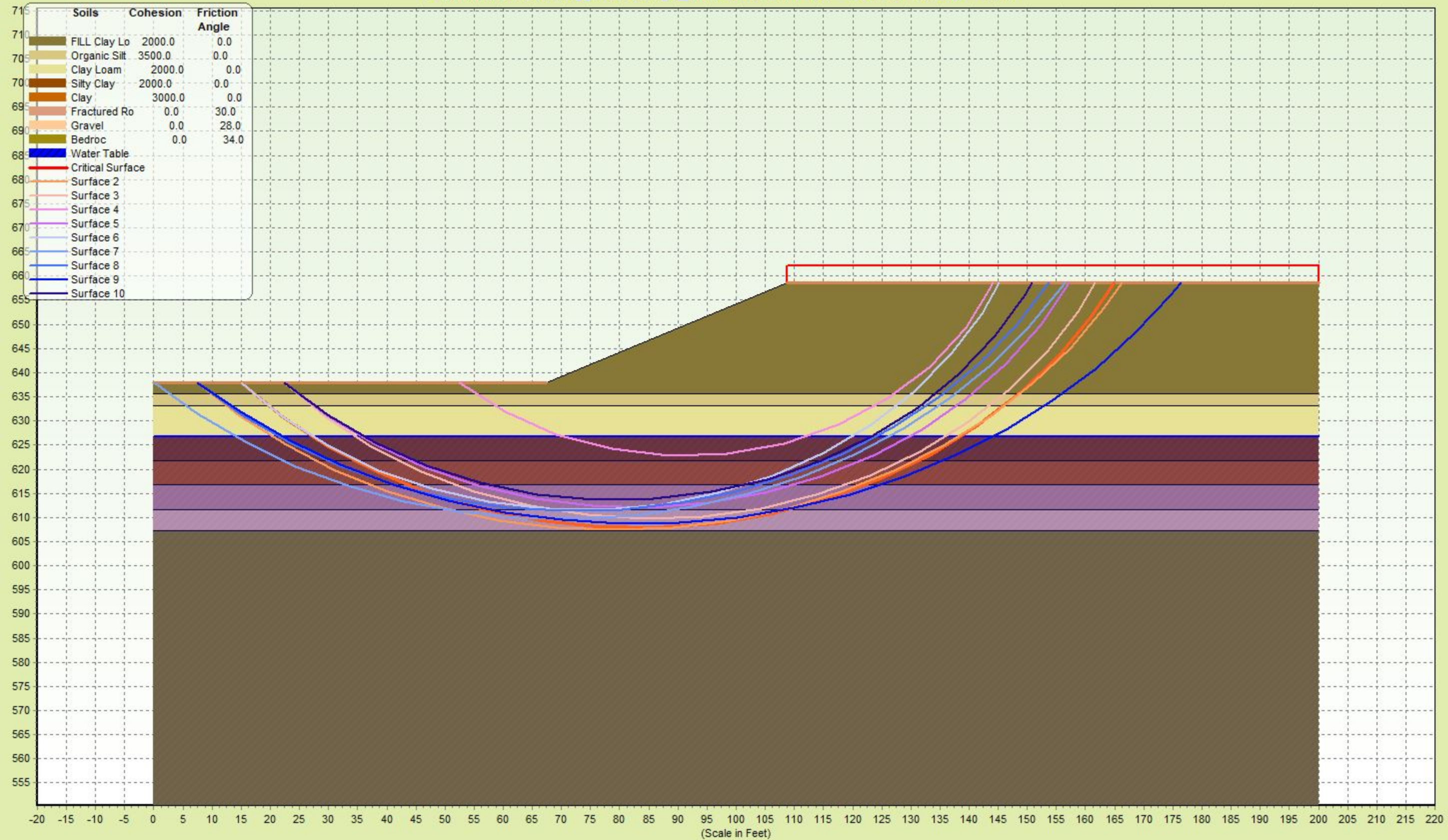




Problem: 20012: Briggs St. Bridge\_Drained BSB-056 - FS Min- Bishop = 1.557

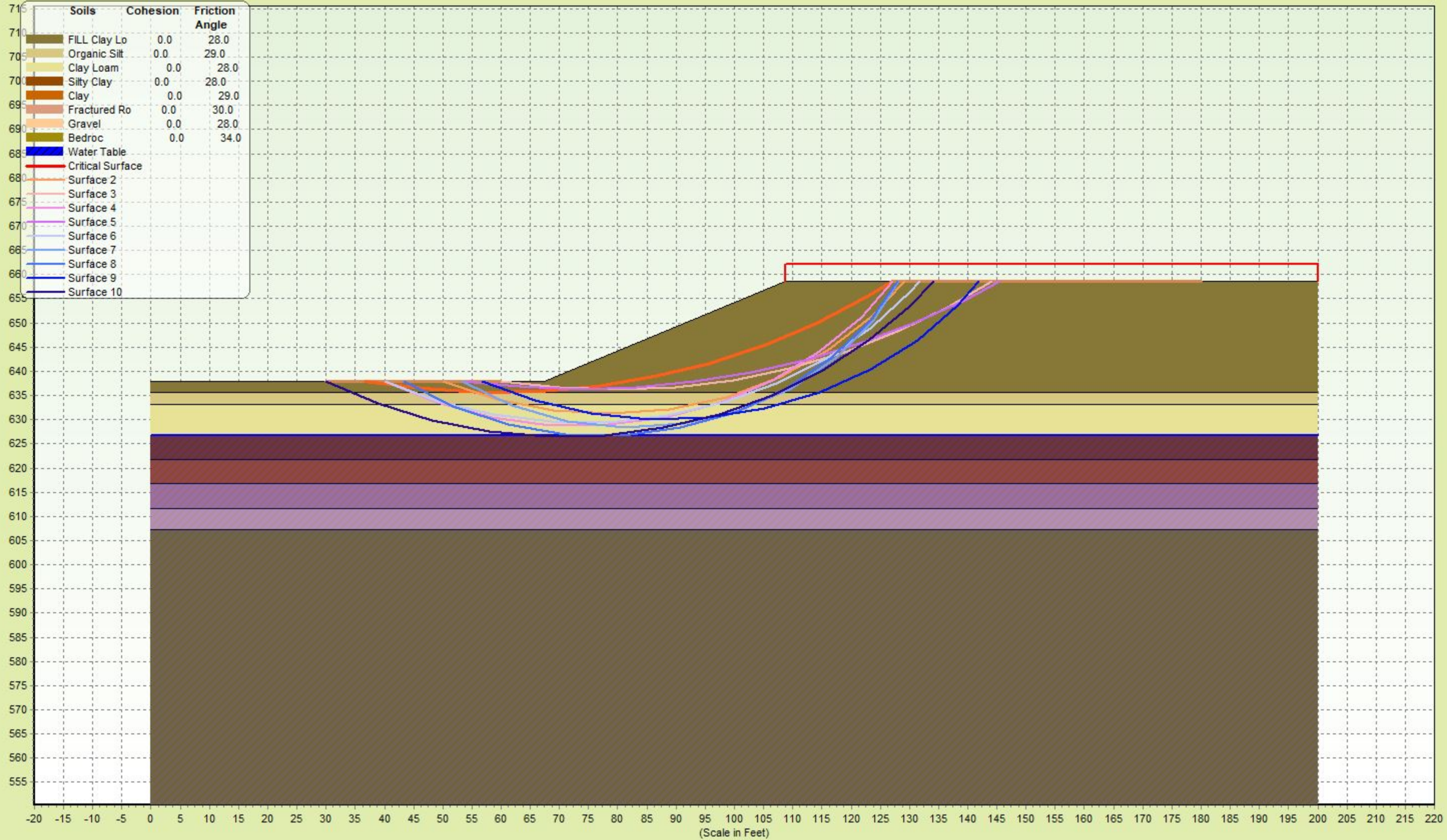


Problem: 20012: Briggs St. Bridge\_Undrained BSB-057 - FS Min- Bishop = 4.49





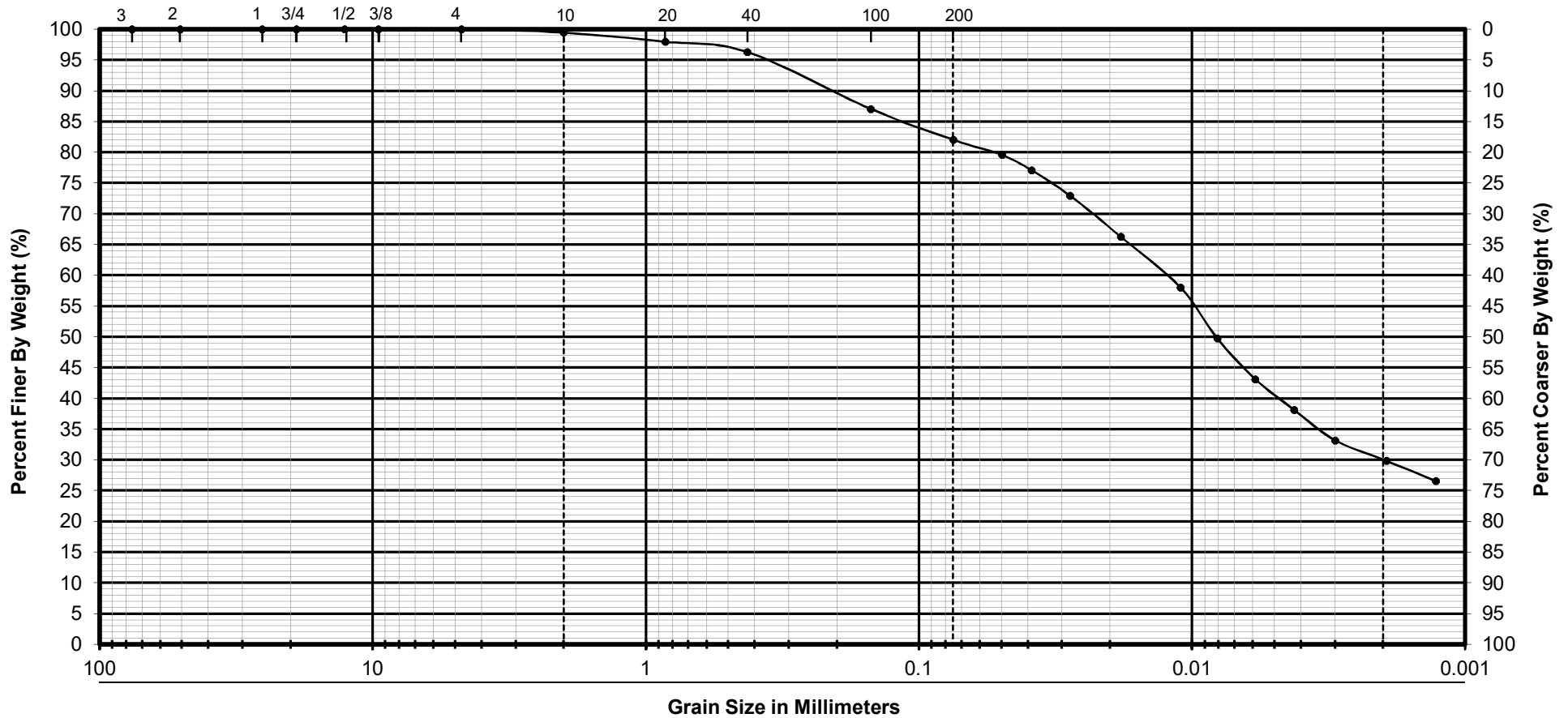
Problem: 20012: Briggs St. Bridge\_Drained BSB-057 - FS Min- Bishop = 1.585




**APPENDIX F**  
**LABORATORY TEST**  
**RESULTS**



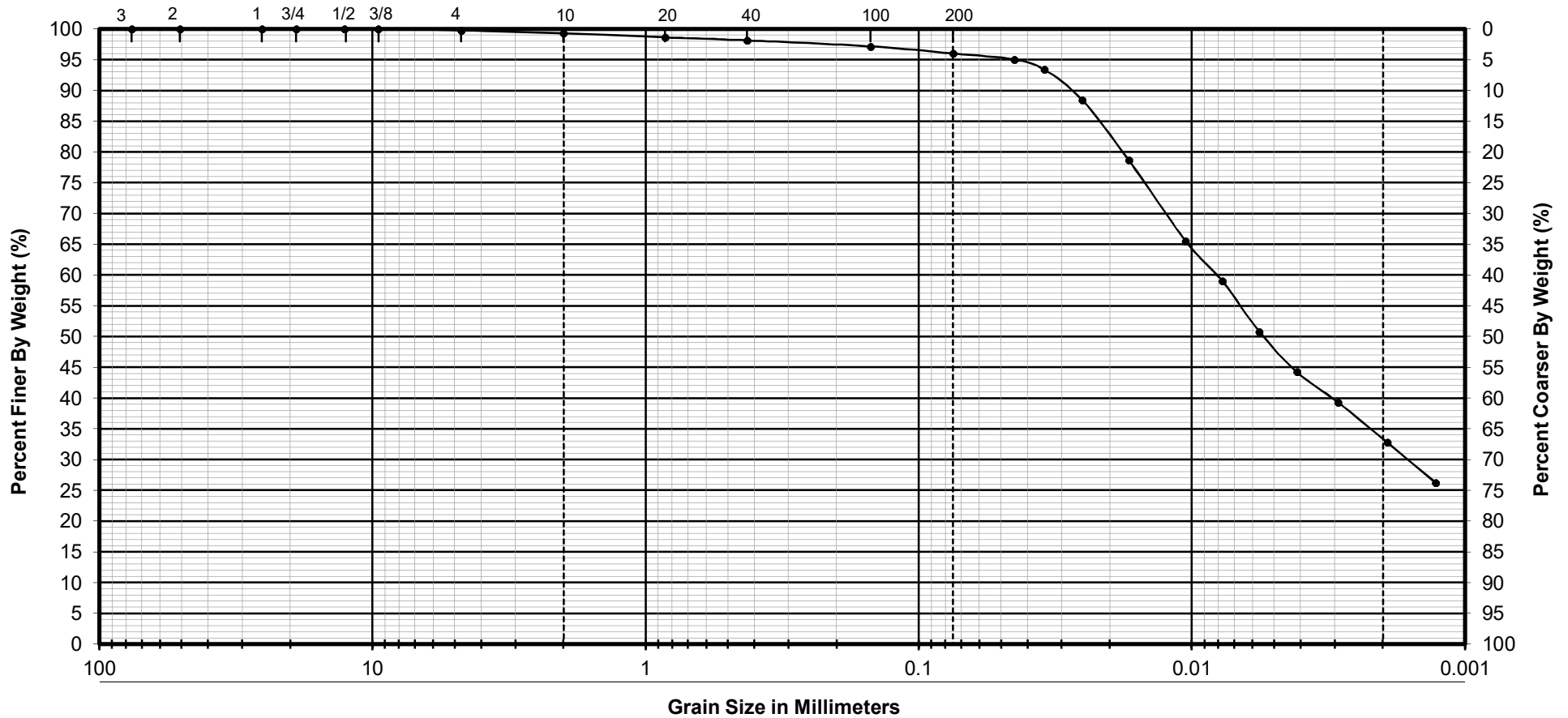





GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

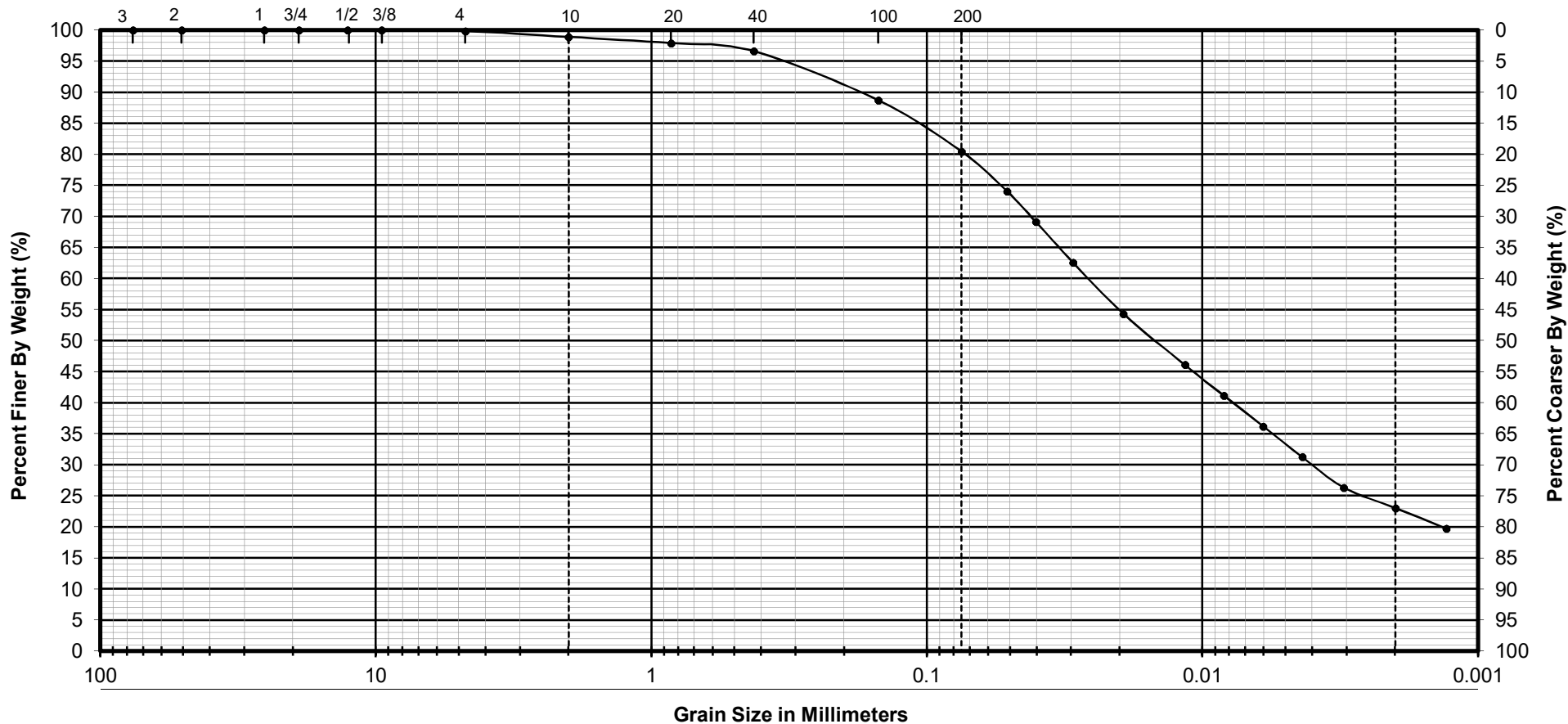
Boring No.	BSB-52	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	4	<b>SILTY CLAY LOAM</b> <b>A-7</b> dark brown/gray Group Index      24 % Gravel          0.6 % Sand             17.4 % Silt               52.2 % Clay              29.8	Proposed Briggs Street Bridge Replacement Over I-80 Will County, Illinois   <b>Geo Services, Inc.</b> Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm  1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	6.0'-7.5'		
Liquid Limit	47		
Plastic Limit	18		
Plasticity Index	29		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		






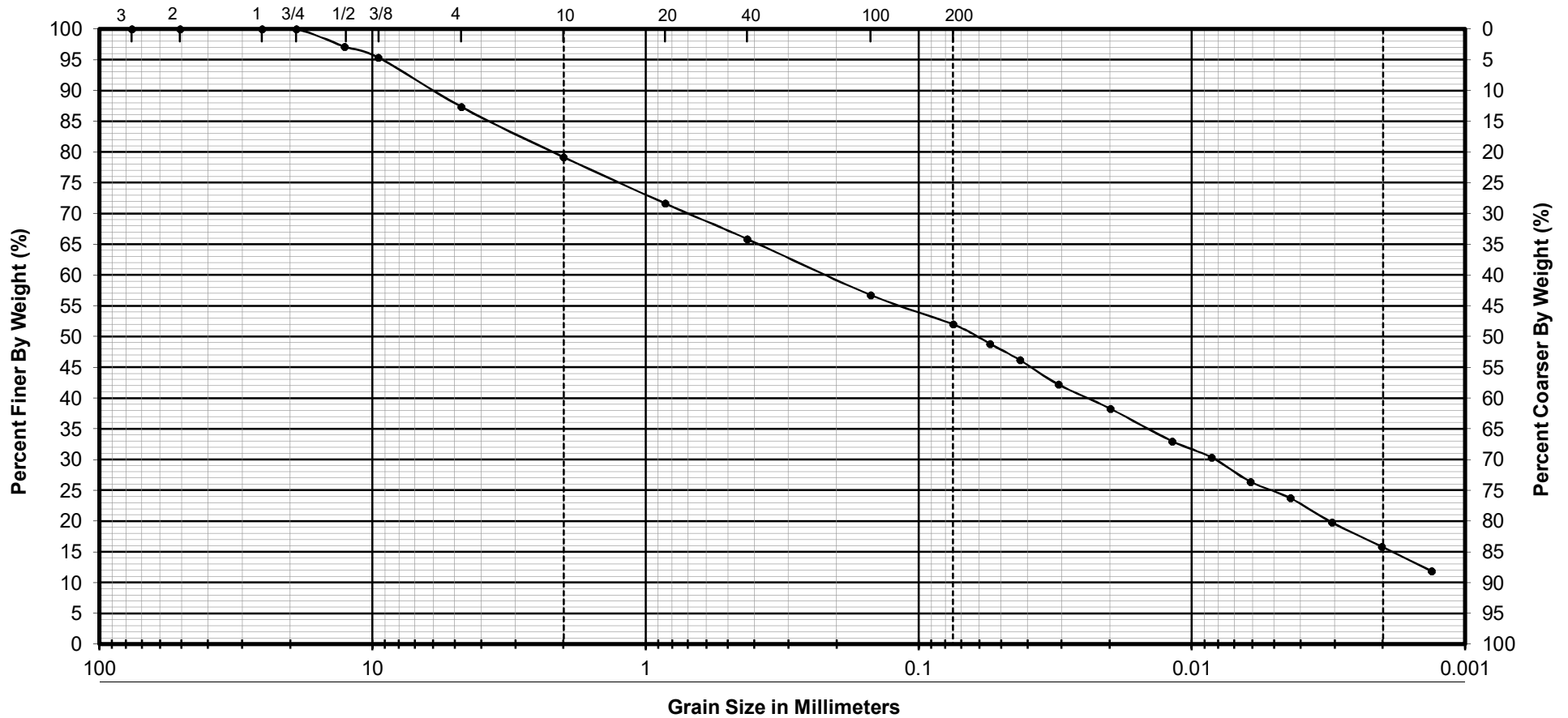
GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-53	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	16	<p style="text-align: center;"><b>SILTY CLAY</b> A-7 gray</p> <p>Group Index      28</p> <p>% Gravel          0.7</p> <p>% Sand             3.3</p> <p>% Silt              63.2</p> <p>% Clay             32.8</p>	<p style="text-align: center;">Proposed Briggs Street Bridge Replacement Over I-80 Will County, Illinois</p> <p style="text-align: center;"> <b>Geo Services, Inc.</b> Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm</p> <p>1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482</p>
Depth	43.5'-45.0'		
Liquid Limit	46		
Plastic Limit	19		
Plasticity Index	27		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		




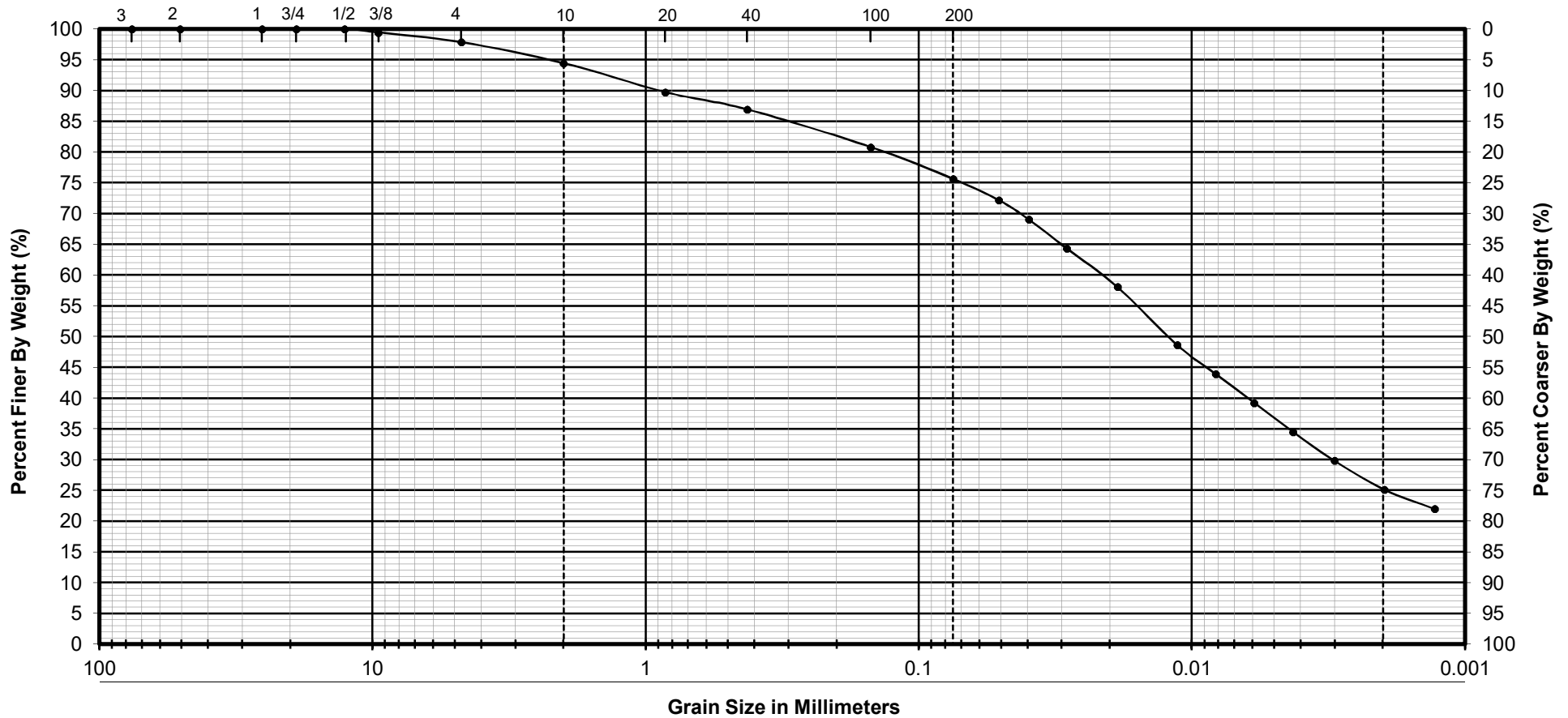
GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-54	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	3	<p style="text-align: center;"><b>SILTY CLAY LOAM</b> A-7 gray</p> <p>Group Index      21</p> <p>% Gravel         1.1</p> <p>% Sand            18.4</p> <p>% Silt             57.4</p> <p>% Clay            23.0</p>	<p style="text-align: center;">Proposed Briggs Street Bridge Replacement Over I-80 Will County, Illinois</p> <p style="text-align: center;"> <b>Geo Services, Inc.</b> Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm</p> <p>1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482</p>
Depth	3.5'-5.0'		
Liquid Limit	46		
Plastic Limit	20		
Plasticity Index	26		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		




GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-57	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	2 & 3	<b>LOAM</b> <b>A-6</b> brown/black Group Index 8 % Gravel 20.8 % Sand 27.2 % Silt 36.2 % Clay 15.8	Proposed Briggs Street Bridge Replacement Over I-80 Will County, Illinois   <b>Geo Services, Inc.</b> Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	1.5'-5.0'		
Liquid Limit	39		
Plastic Limit	15		
Plasticity Index	24		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		



GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-57	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	11	<b>SILTY CLAY LOAM</b> <b>A-7</b> <b>brown/black</b> Group Index      20 % Gravel          5.5 % Sand             18.8 % Silt              50.5 % Clay             25.1	Proposed Briggs Street Bridge Replacement Over I-80 Will County, Illinois   <b>Geo Services, Inc.</b> Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm  1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	23.0'-25.5'		
Liquid Limit	47		
Plastic Limit	20		
Plasticity Index	27		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		

**Liquid Limit, Plastic Limit, and Plasticity Index of Soils**  
AASHTO T89/T90

Project Name I-80 Phase II: Proposed Briggs St Bridge

Job No 20012

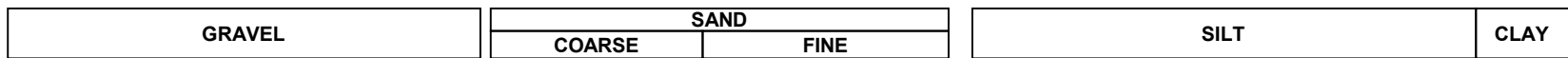
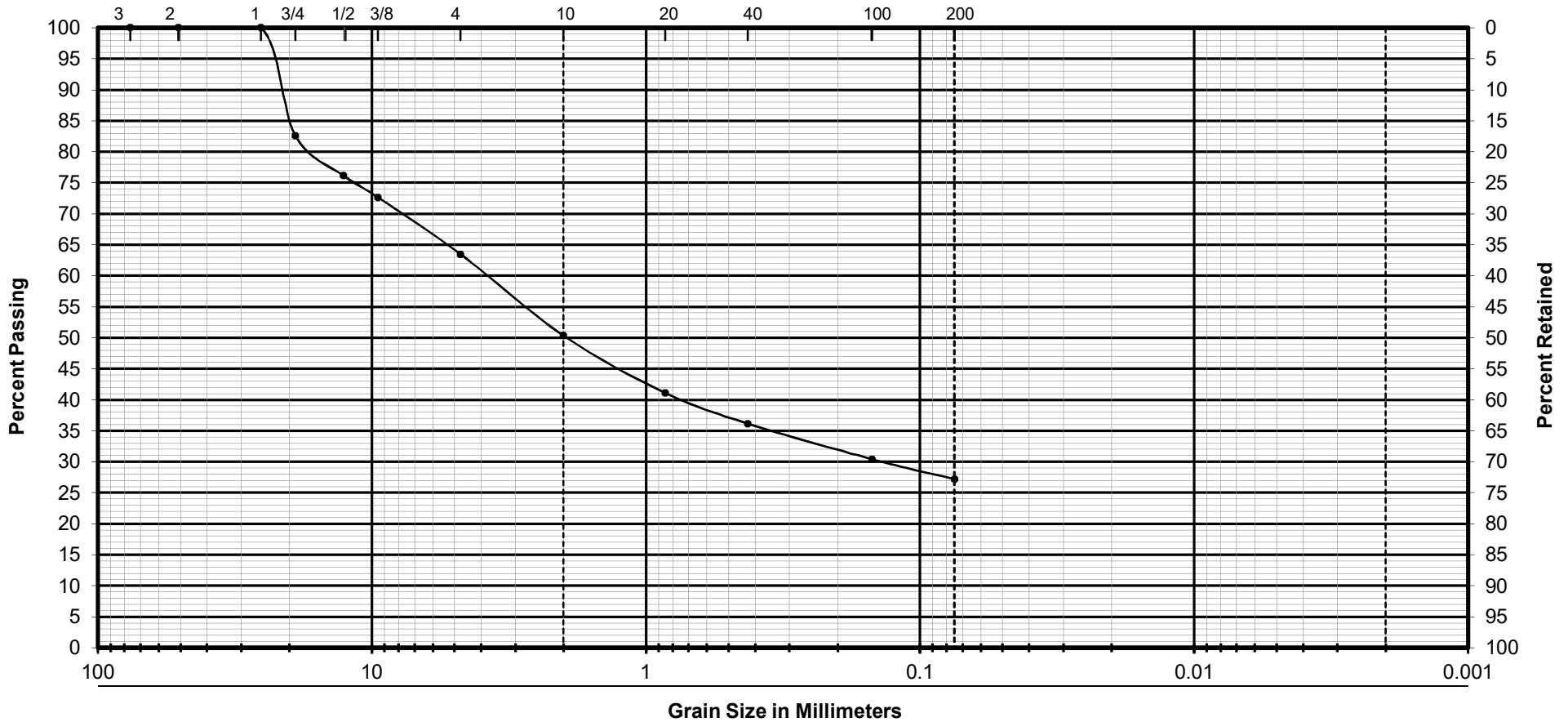
Location Will County, Illinois

Date 9/22/21

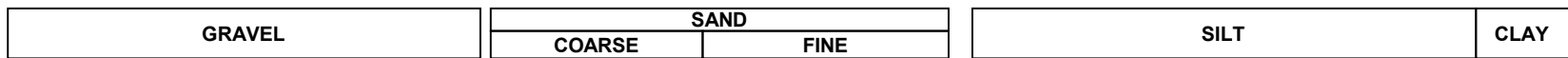
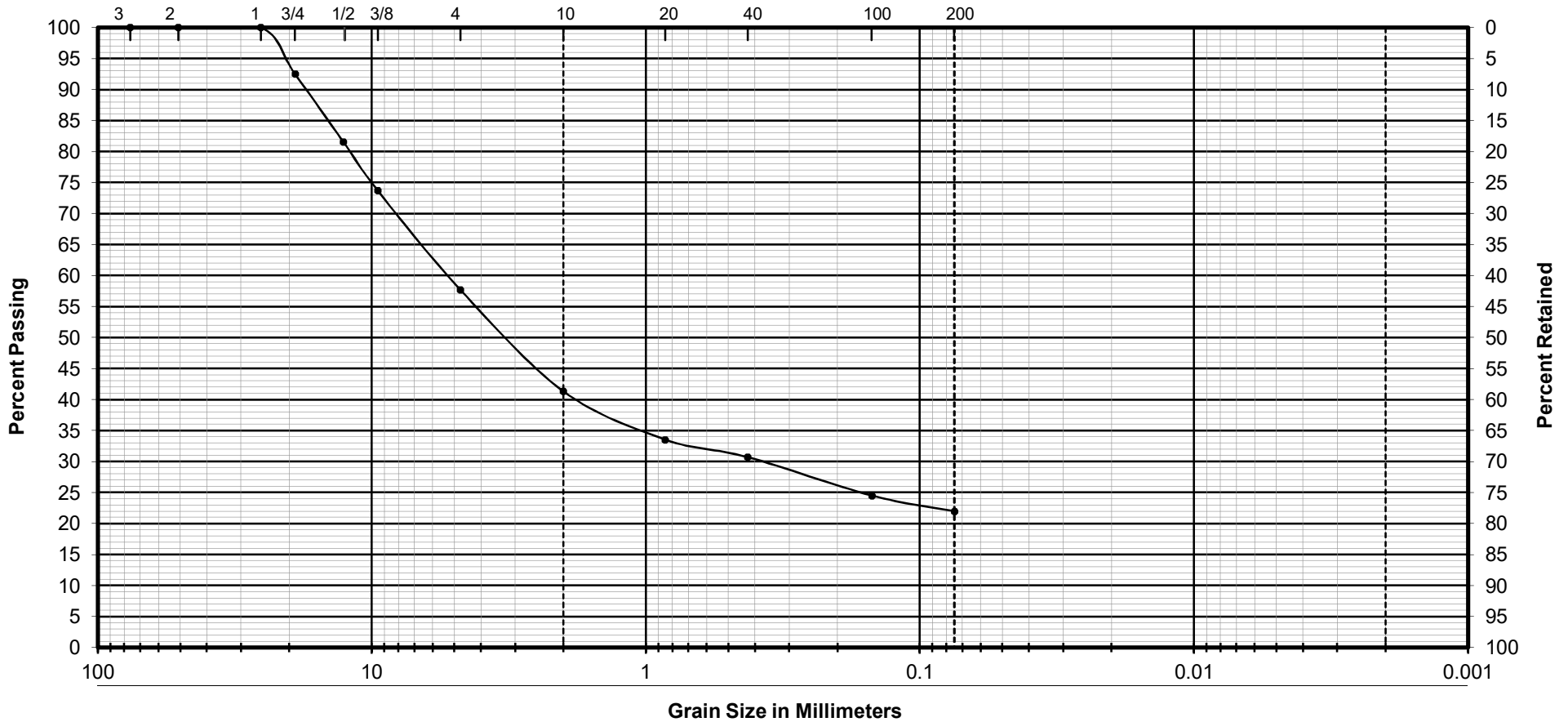
SAMPLE NO.	BSB-052	BSB-053	BSB-053	BSB-054	BSB-057	BSB-057	
DEPTH	6.0'-7.5'	3.5'-5.0'	43.5'-45.0'	3.5'-5.0'	1.5'-5.0'	23.0'-25.5'	
LIQUID LIMIT (LL)	47	43	46	46	39	47	
PLASTIC LIMIT (PL)	18	18	19	20	15	20	
PLASTICITY INDEX (PI)	29	25	27	26	24	27	

Test by MT

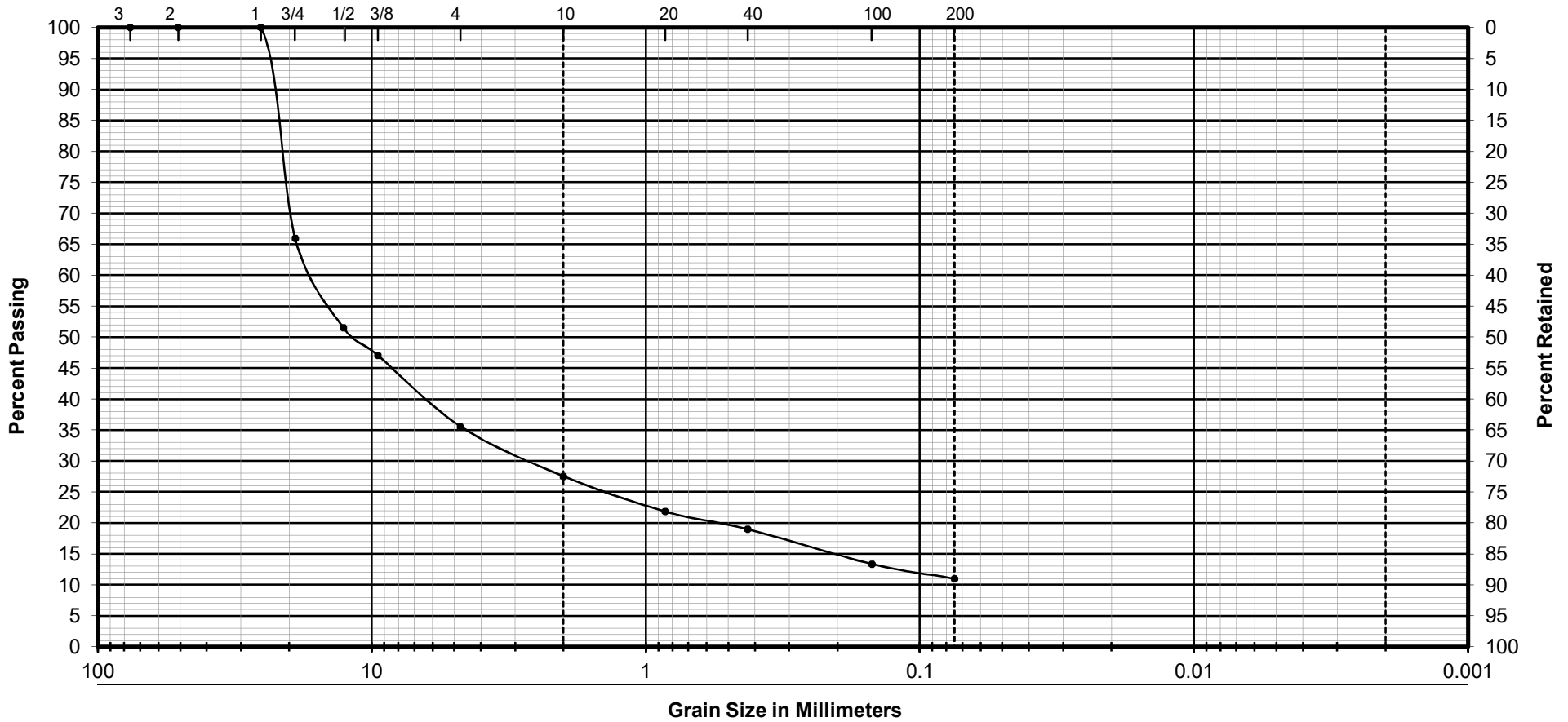





Boring No.	BSB-52	CLASSIFICATION	GRAIN-SIZE ANALYSIS-AASHTO T 311
Sample No.	16	<b>GRAVEL &amp; SAND</b> <b>A-2-4</b> <b>brown</b>  Group Index <b>0</b> % Gravel <b>49.7</b> % Sand <b>23.1</b> % Silt / Clay <b>27.2</b>	<b>Proposed Briggs Street Bridge</b> <b>Replacement Over I-80</b> <b>Will County, Illinois</b>  <b>Geo Services, Inc.</b> <small>Geotechnical, Environmental and Civil Engineering</small> <small>An MBE - DBE Firm</small>  <b>1235 E. Davis St., Arlington Heights, IL 60005</b> <b>Phone 847-253-3845 • Fax 847-253-0482</b>
Depth	43.5'-45.0'		
Liquid Limit	-		
Plastic Limit	-		
Plasticity Index	NP		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		



Boring No.	BSB-54	CLASSIFICATION	GRAIN-SIZE ANALYSIS-AASHTO T 311
Sample No.	13	<b>GRAVEL &amp; SAND</b> <b>A-1-a</b> <b>brown/gray</b>  Group Index      0 % Gravel          58.7 % Sand              19.3 % Silt / Clay      22.0	<b>Proposed Briggs Street Bridge</b> <b>Replacement Over I-80</b> <b>Will County, Illinois</b>  <b>Geo Services, Inc.</b> <small>Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm</small>  <b>1235 E. Davis St., Arlington Heights, IL 60005</b> <b>Phone 847-253-3845 • Fax 847-253-0482</b>
Depth	28.5'-30.0'		
Liquid Limit	-		
Plastic Limit	-		
Plasticity Index	NP		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		



Boring No.	BSB-55	CLASSIFICATION	GRAIN-SIZE ANALYSIS-AASHTO T 311
Sample No.	11 & 12	<b>GRAVEL &amp; SAND</b> A-1-a brown Group Index      0 % Gravel          72.5 % Sand             16.5 % Silt / Clay      11.0	Proposed Briggs Street Bridge Replacement Over I-80 Will County, Illinois   <b>Geo Services, Inc.</b> <small>Geotechnical, Environmental and Civil Engineering            An MBE - DBE Firm</small> 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	23.0'-27.5'		
Liquid Limit	-		
Plastic Limit	-		
Plasticity Index	NP		
Test By	MT		
Date	9/20/21		
Reviewed By	AT		
Job No	20012		



1235 East Davis Street  
 Arlington Heights, IL 60005  
 Phone (847) 253-3845  
 Fax (847) 253-0482

**DETERMINATION of ORGANIC CONTENT in SOILS by LOSS on IGNITION  
 AASHTO T267**

**Project Name** I-80 Phase II: Proposed Briggs St Bridge **Date** 09/17/21

**Location** Will County, IL **Job No** 20012

**Boring No.** BSB-54 **Sample No.** 3 **Depth** 3.5'-5.0'

**Sample Description** SILTY CLAY-black **Testing Furnace Temp °C.:** 440

<b>Moisture Content</b>	Wet Soil+Tare (g)	Dry Soil+Tare (g)	Tare Mass (g)	w (%)
Oven-Dry Method	72.12	68.04	48.47	20.8

<b>Ash Content</b>	Dry Soil+Tare (g)	Ash+Tare (g)	Tare Mass (g)	Ash content (%)
Loss on Ignition	68.04	67.33	48.47	96.4

**Organic Content (%) =** 3.6

**Notes:** \_\_\_\_\_

**Test By** MT



1235 East Davis Street  
 Arlington Heights, IL 60005  
 Phone (847) 253-3845  
 Fax (847) 253-0482

**DETERMINATION of ORGANIC CONTENT in SOILS by LOSS on IGNITION  
 AASHTO T267**

**Project Name** I-80 Phase II: Proposed Briggs St Bridge      **Date** 09/17/21  
**Location** Will County, IL      **Job No** 20012

**Boring No.** BSB-57      **Sample No.** 11      **Depth** 23.5'-25.0'

**Sample Description** ORGANIC SILTY CLAY-black      **Testing Furnace Temp °C.:** 440

<b>Moisture Content</b>	Wet Soil+Tare (g)	Dry Soil+Tare (g)	Tare Mass (g)	w (%)
Oven-Dry Method	84.36	77.07	48.27	25.3

<b>Ash Content</b>	Dry Soil+Tare (g)	Ash+Tare (g)	Tare Mass (g)	Ash content (%)
Loss on Ignition	77.07	76.28	48.27	97.3

**Organic Content (%) =** 2.7

**Notes:** \_\_\_\_\_

**Test By** MT

**APPENDIX G**

**PILE TABLES FOR BRIGGS  
STREET BRIDGE OVER I-80**

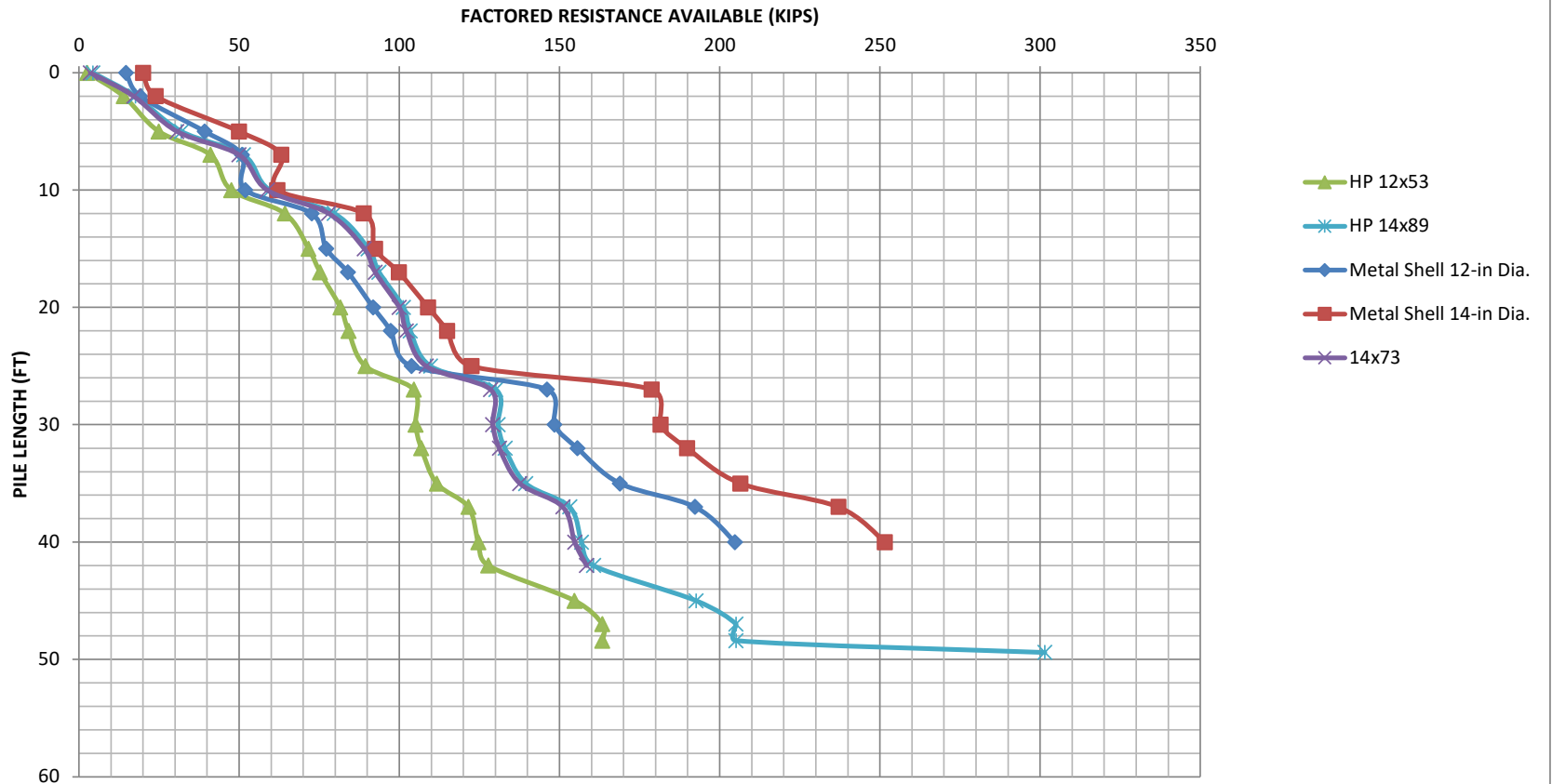
**Estimated Pile Lengths and Capacities for 20012 BSB-52**

Boring BSB-52 (Ground Surface Elevation against Pile during driving = 659.00, Pile Cutoff Elevation = 653.85)														
Estimated Pile Length (ft.)	HP 8x36		HP 10x42		HP 12x53		HP 14x73		HP 14x89		Metal Shell 12" <sup>1</sup>		Metal Shell 14" <sup>2</sup>	
	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)
0	2	3	2	4	3	5	4	6	4	8	15	27	20	36
2	9	17	12	21	14	25	17	31	18	32	19	35	24	44
5	17	30	21	38	25	45	31	56	32	58	39	71	50	91
7	28	50	34	62	41	75	50	91	51	93	51	93	63	115
10	30	54	38	69	48	86	59	107	60	108	52	94	62	113
12	43	78	54	98	64	117	78	142	80	145	73	132	89	162
15	45	81	57	104	72	130	89	162	90	164	77	140	92	168
17	48	87	60	110	75	137	92	168	94	170	84	153	100	181
20	52	95	66	120	82	148	100	182	101	184	92	167	109	198
22	55	99	68	124	84	153	102	186	103	188	97	177	115	209
25	58	106	73	132	89	163	108	197	110	199	104	189	123	223
27	66	121	84	153	104	190	128	234	130	237	146	266	179	325
30	67	121	84	154	105	191	129	235	131	238	148	270	182	330
32	68	124	86	156	107	194	131	239	133	242	156	283	190	345
35	71	128	90	163	112	203	138	250	139	254	169	307	206	375
37	76	137	97	176	122	221	151	275	153	278	192	350	237	431
40	78	141	99	180	125	227	155	281	157	285	205	372	252	457
42	80	145	102	185	128	232	158	288	161	292				
45	104	189	129	235	155	281	188	342	193	350				
47	110	200	136	248	163	297	199	362	205	373				
48	110	200	136	248	163	297	199	362	205	373				
49							295	536	301	548				

<sup>1</sup> Metal Shell Pile 12" diameter with 0.25" walls

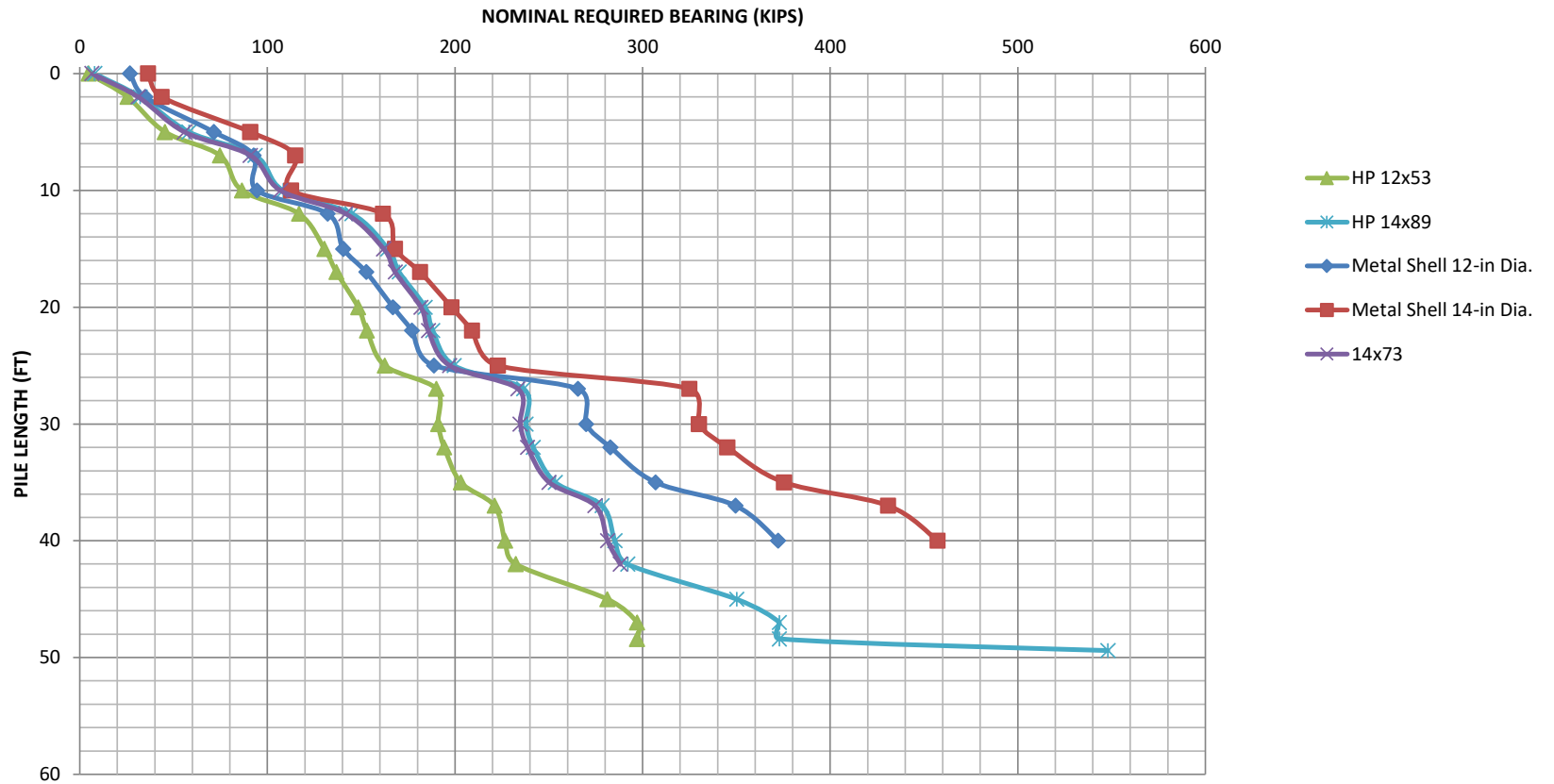
<sup>2</sup> Metal Shell Pile 14" diameter with 0.250" walls

# PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH Boring BSB-52





# PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH Boring BSB-52



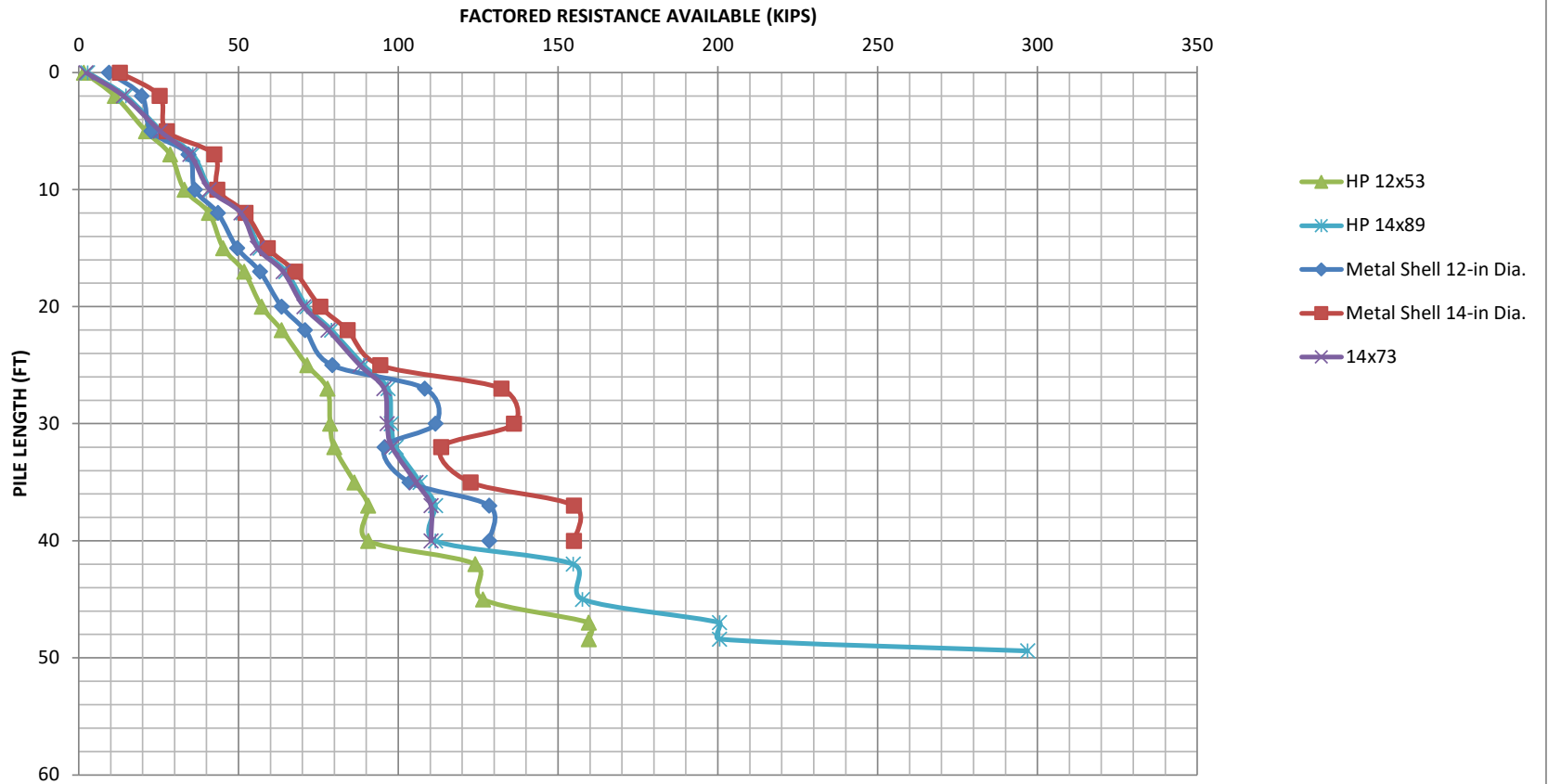
**Estimated Pile Lengths and Capacities for 20012 BSB-53**

Boring BSB-53 (Ground Surface Elevation against Pile during driving = 659.00, Pile Cutoff Elevation = 653.85 (657 for timber))														
Estimated Pile Length (ft.)	HP 8x36		HP 10x42		HP 12x53		HP 14x73		HP 14x89		Metal Shell 12" <sup>1</sup>		Metal Shell 14" <sup>2</sup>	
	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)
0	1	2	1	2	2	3	2	4	3	5	9	17	13	23
2	8	14	9	17	11	21	14	26	15	27	20	36	25	46
5	14	25	18	32	21	38	25	46	26	47	23	41	28	50
7	19	35	24	43	29	52	35	63	36	65	34	62	42	77
10	21	38	26	48	33	60	41	74	41	75	36	66	43	79
12	25	46	32	59	41	74	51	92	51	94	44	79	52	95
15	28	52	36	66	45	82	56	102	57	103	50	90	59	107
17	33	59	41	75	52	94	64	116	65	118	57	103	68	123
20	36	66	46	83	57	104	70	128	71	130	64	115	76	137
22	40	73	51	93	63	115	78	142	79	144	71	129	84	153
25	45	82	57	104	71	130	88	160	89	162	79	144	94	172
27	50	90	63	114	78	141	96	174	97	176	108	197	132	240
30	50	91	63	115	79	143	97	175	98	178	112	203	136	248
32	51	93	64	117	80	145	98	178	99	181	96	174	113	206
35	55	101	70	127	86	157	106	192	107	194	104	188	123	223
37	59	107	74	134	91	165	110	200	112	203	128	234	155	282
40	59	107	74	134	91	165	110	200	112	203	128	234	155	282
42	83	152	104	188	124	226	151	274	155	281				
45	85	155	106	192	126	230	154	279	158	287				
47	107	195	133	242	160	290	195	354	201	365				
48	107	195	133	242	160	290	195	354	201	365				
49							290	528	297	540				

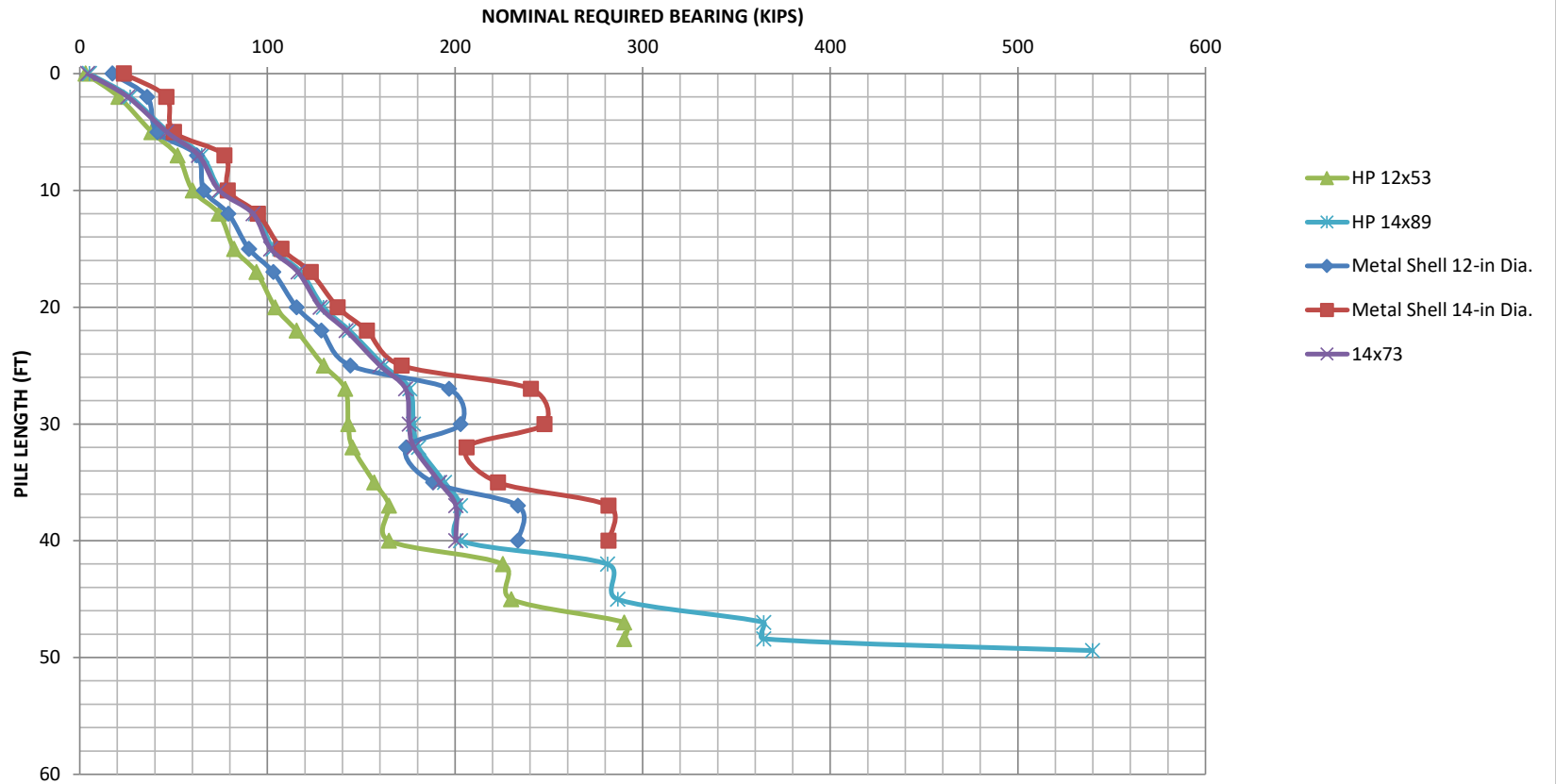
<sup>1</sup> Metal Shell Pile 12" diameter with 0.25" walls

<sup>2</sup> Metal Shell Pile 14" diameter with 0.250" walls

# PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH Boring BSB-53

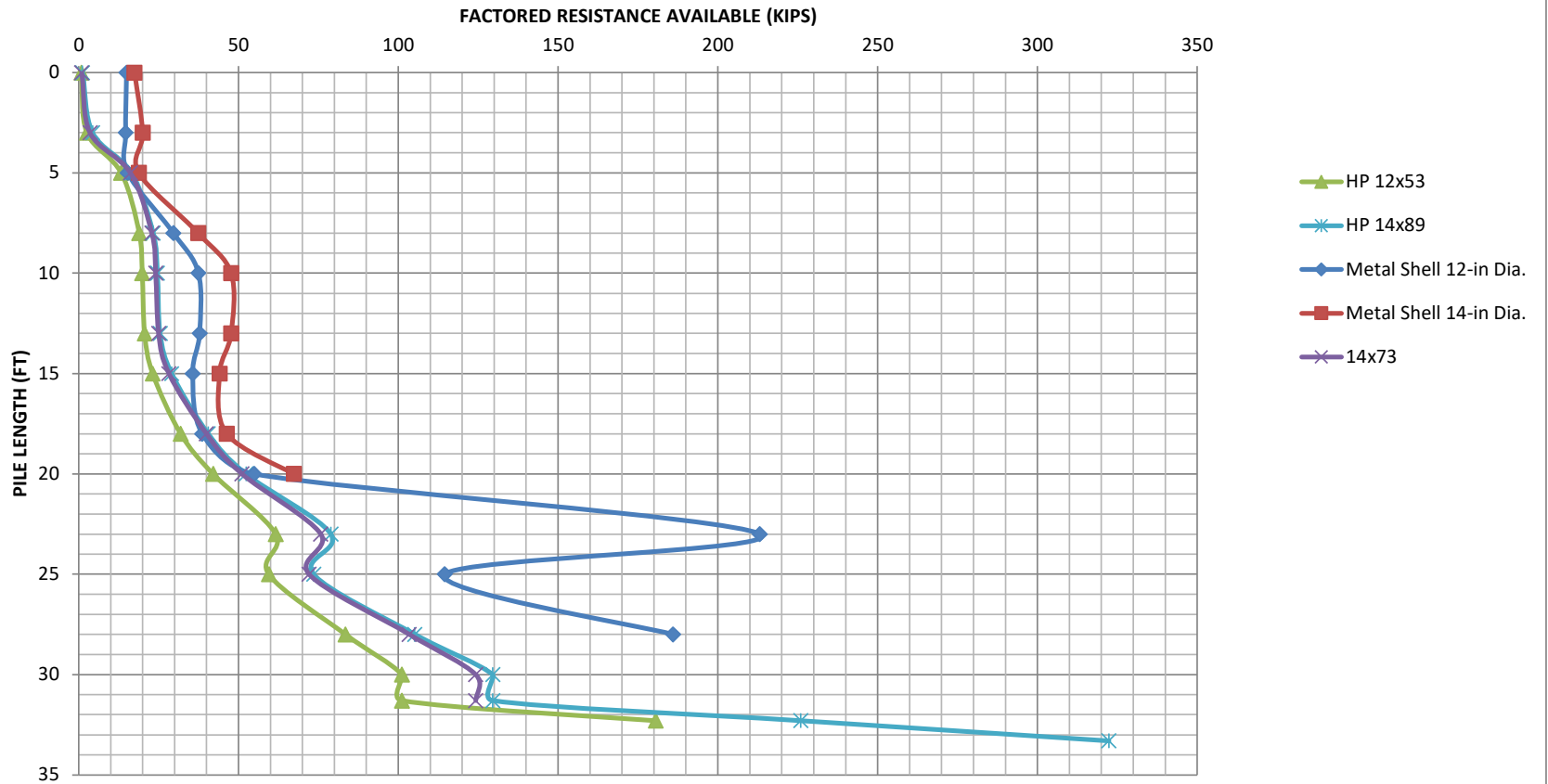


# PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH Boring BSB-53

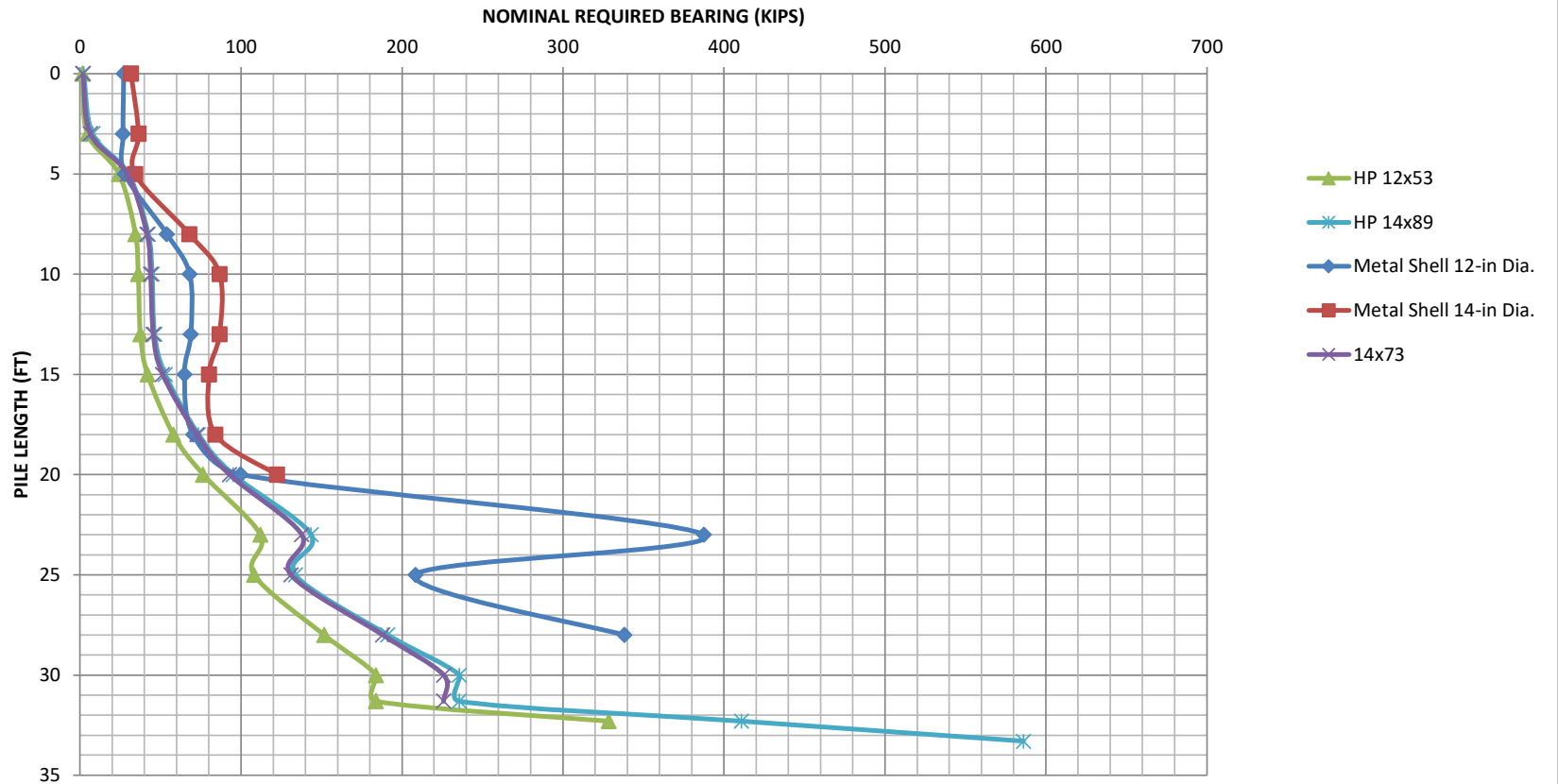




## PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH Boring BSB-54



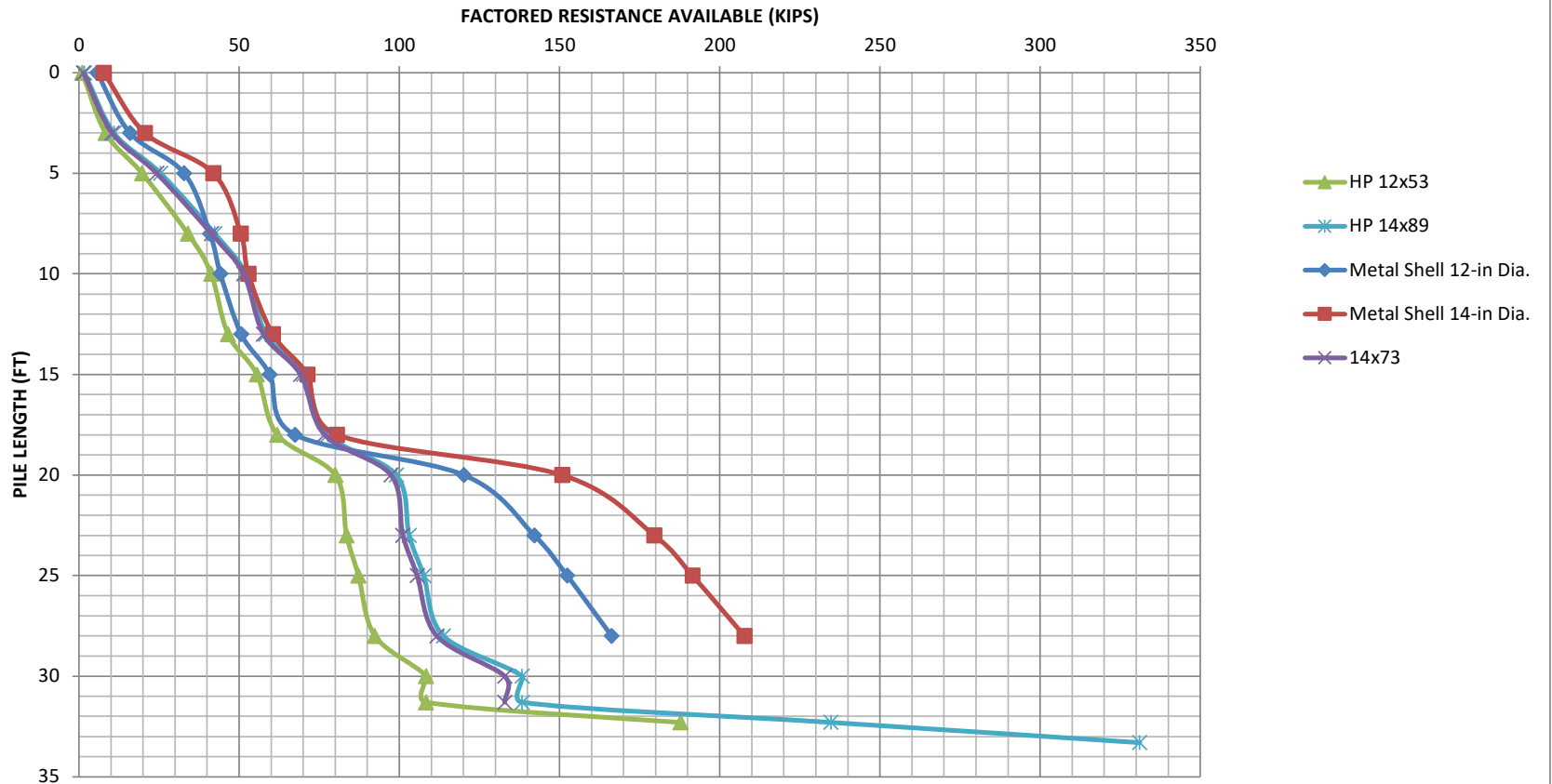
# PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH Boring BSB-54



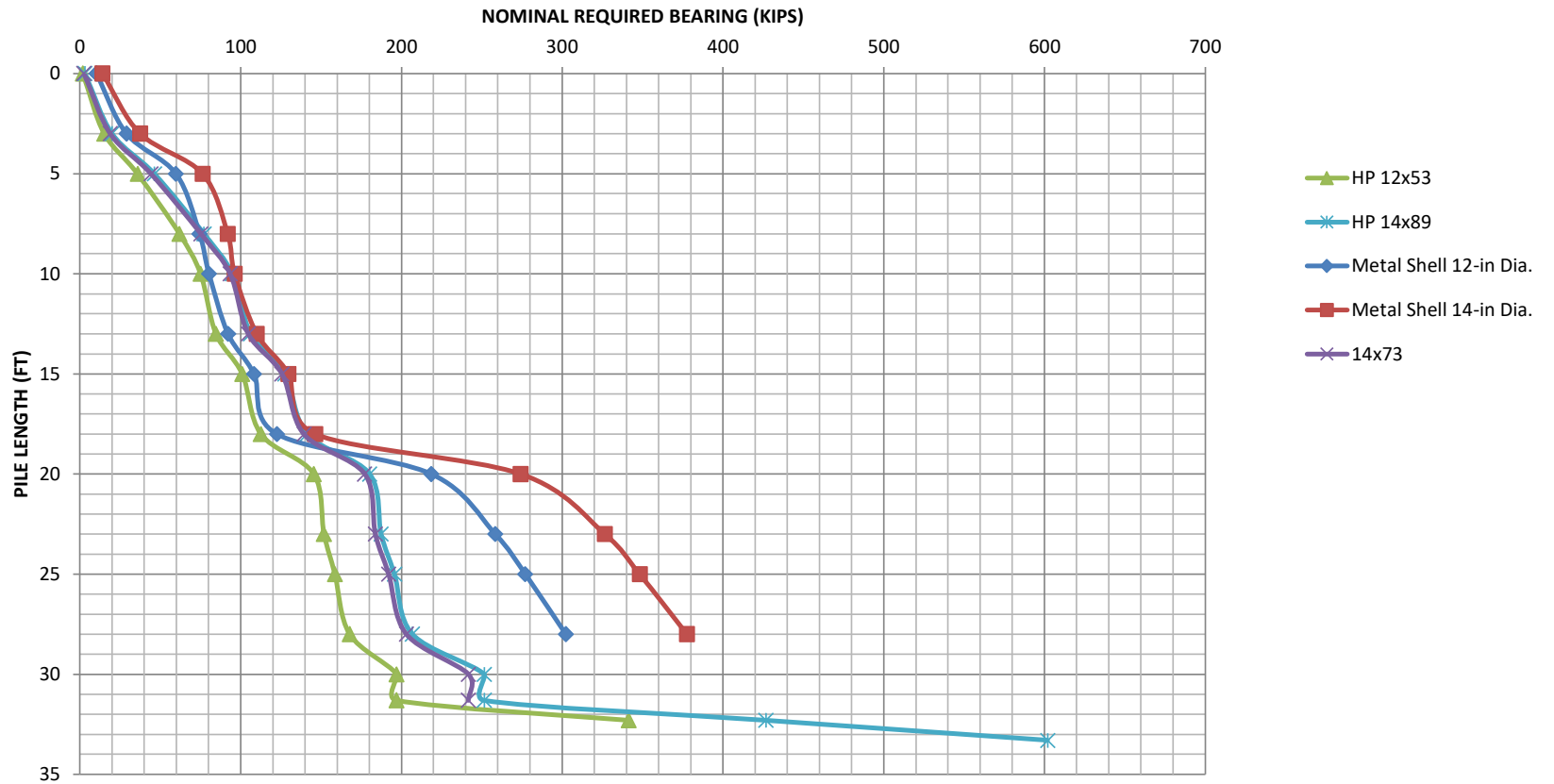




# PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH Boring BSB-55

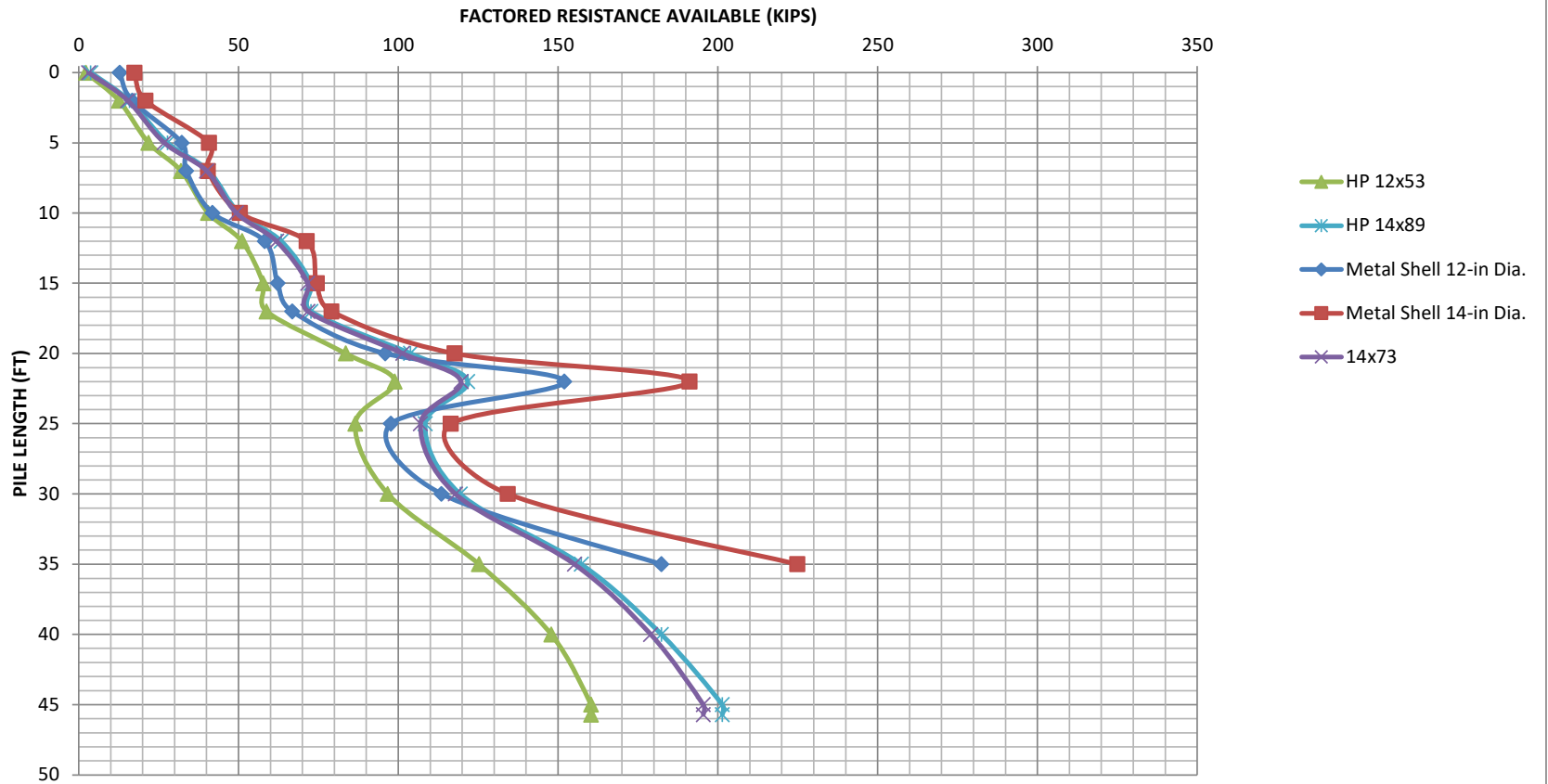


# PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH Boring BSB-55

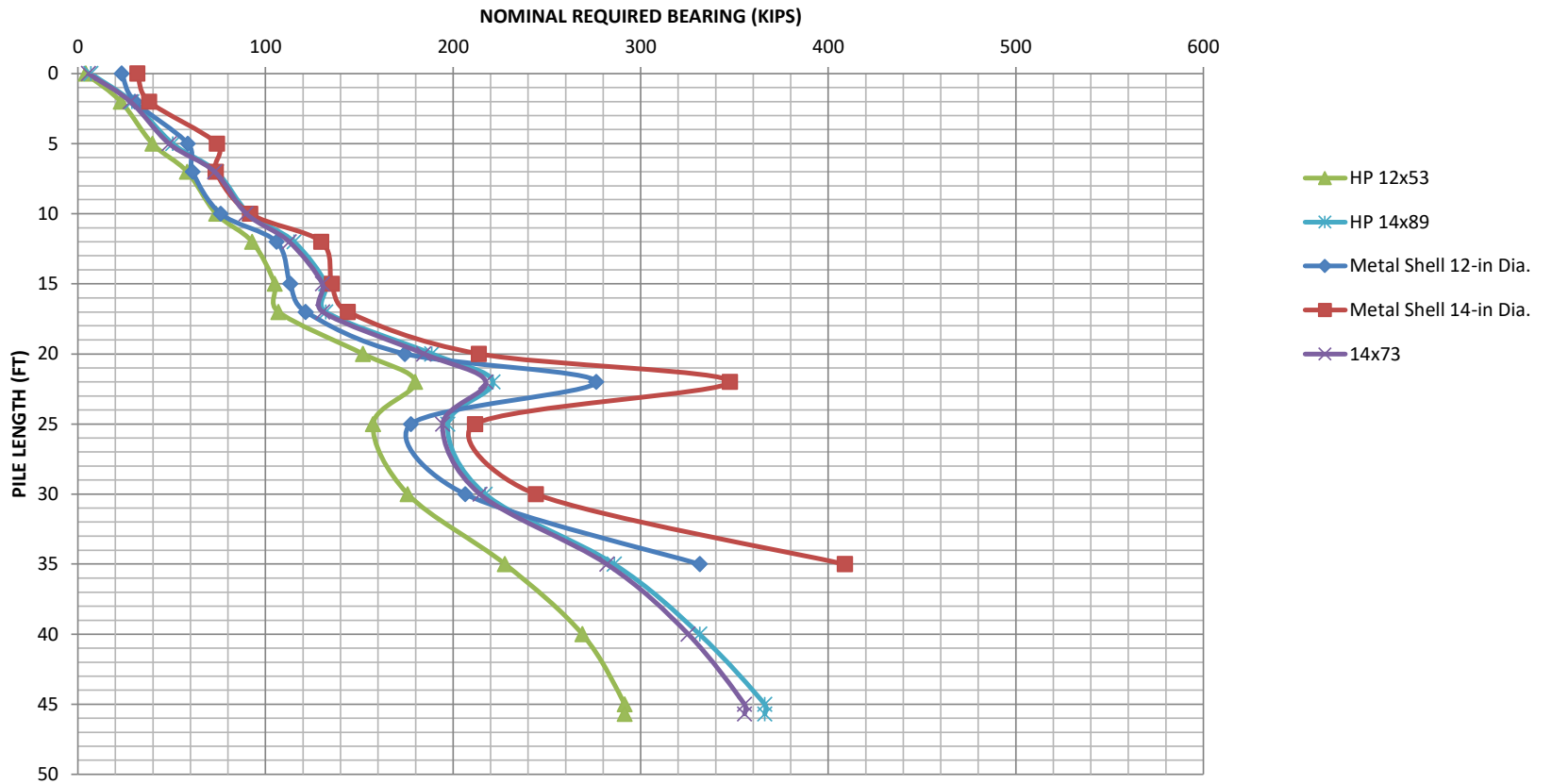




# PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH Boring BSB-56



# PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH Boring BSB-56

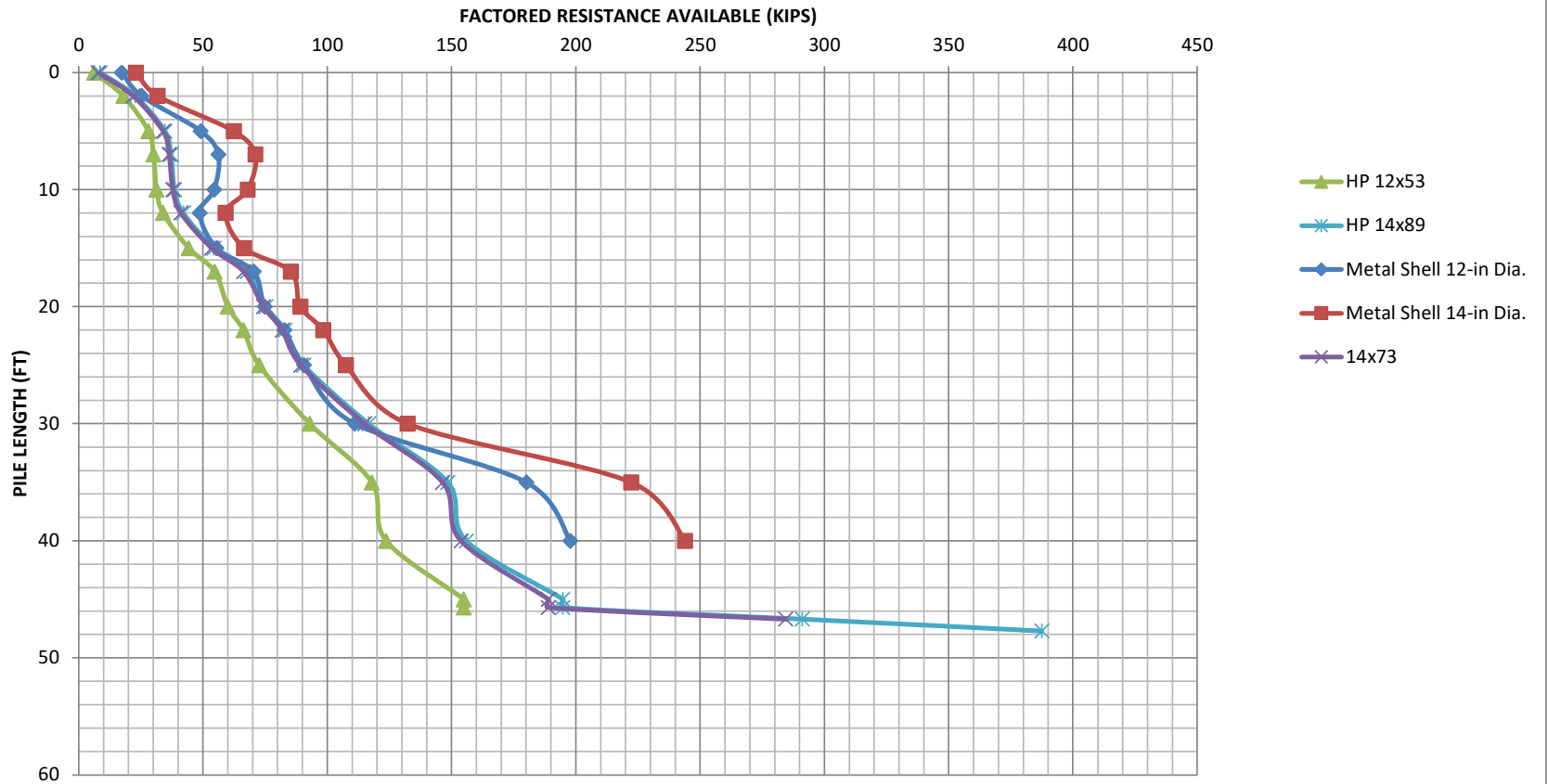


**Estimated Pile Lengths and Capacities for 20012 BSB-57**

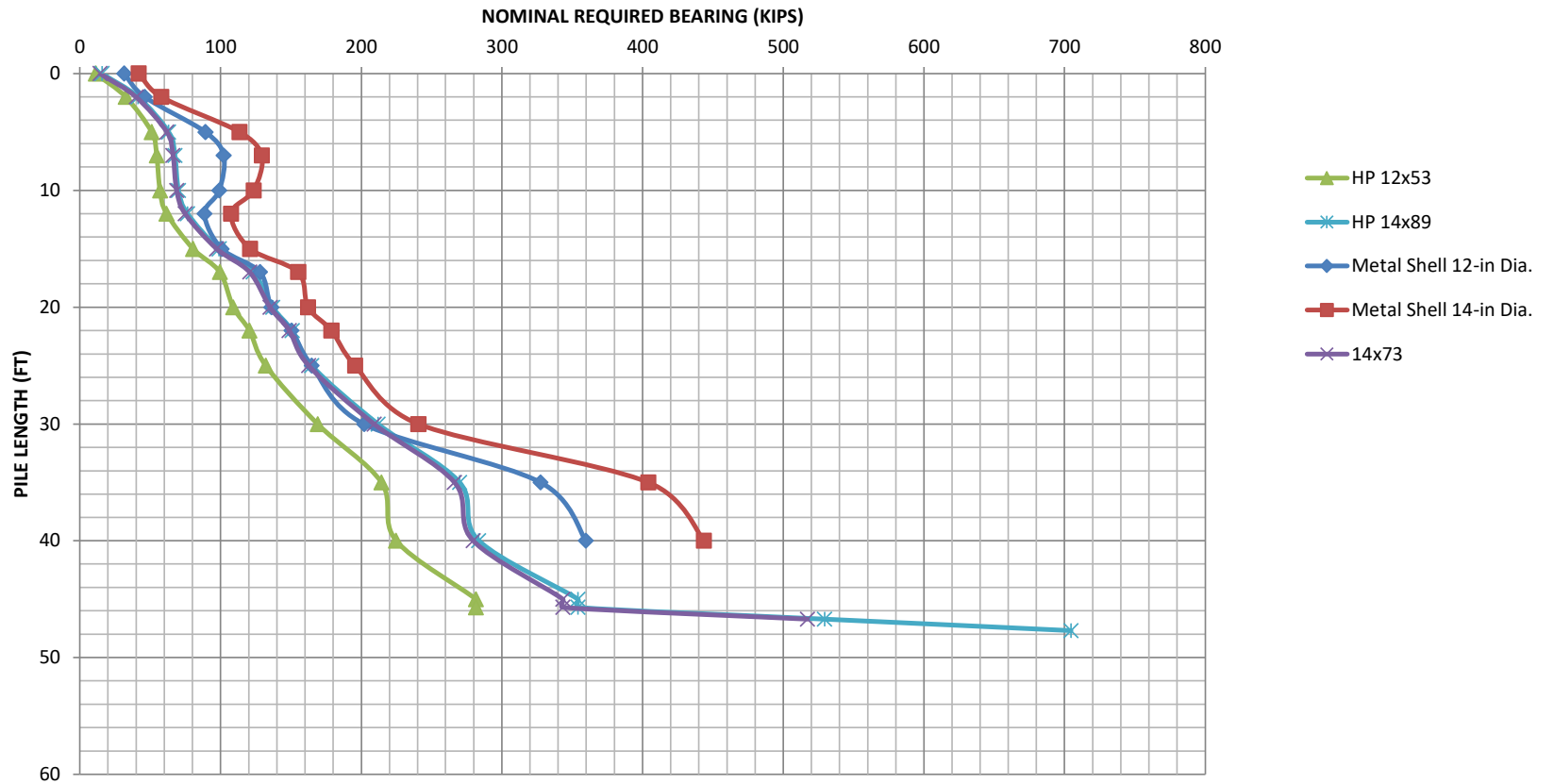
Boring BSB-57 (Ground Surface Elevation against Pile during driving = 659, Pile Cutoff Elevation = 653.65)														
Estimated Pile Length (ft.)	HP 8x36		HP 10x42		HP 12x53		HP 14x73		HP 14x89		Metal Shell 12" <sup>1</sup>		Metal Shell 14" <sup>2</sup>	
	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)	Factored Resistance Available, FRA (Kips)	Nominal Required Bearing, NRB (Kips)
0	4	8	5	9	6	11	8	14	9	16	17	31	23	42
2	12	22	15	27	18	33	22	40	23	41	25	46	32	58
5	18	34	23	43	28	51	34	62	35	63	49	89	62	113
7	20	36	25	46	30	55	36	66	37	68	56	102	71	129
10	19	35	25	45	31	57	38	69	39	70	55	99	68	124
12	23	41	28	51	34	62	41	75	42	77	49	89	59	107
15	27	49	35	63	44	80	53	97	54	99	55	101	66	121
17	36	66	46	83	55	100	66	121	68	123	70	128	85	155
20	37	68	48	87	60	109	74	135	75	137	75	136	89	162
22	42	76	53	96	66	121	82	149	83	151	83	150	98	179
25	46	84	58	106	73	132	89	163	91	165	91	165	108	196
30	58	106	74	135	93	169	115	209	117	212	111	202	132	241
35	73	133	94	170	118	214	146	266	148	270	180	327	222	404
40	77	139	98	178	124	225	154	280	156	284	198	360	244	444
45	104	189	129	235	155	282	189	343	195	354				
46	104	189	129	235	155	282	189	343	195	354				
47							284	517	291	529				
48									388	705				

<sup>1</sup> Metal Shell Pile 12" diameter with 0.25" walls  
<sup>2</sup> Metal Shell Pile 14" diameter with 0.250" walls

# PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH Boring BSB-57



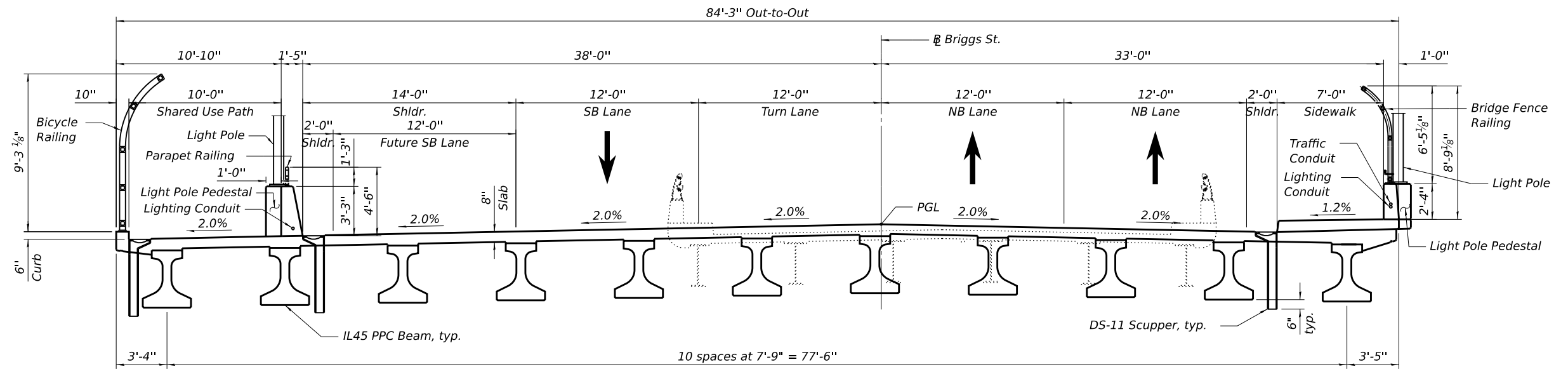
# PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH Boring BSB-57



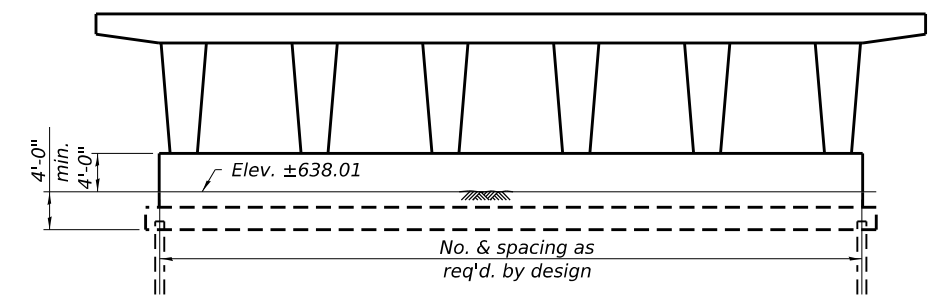


**APPENDIX H**  
**PROGRESS SET DRAWING**  
**FOR THE BRIGGS STREET**  
**BRIDGE OVER I-80**

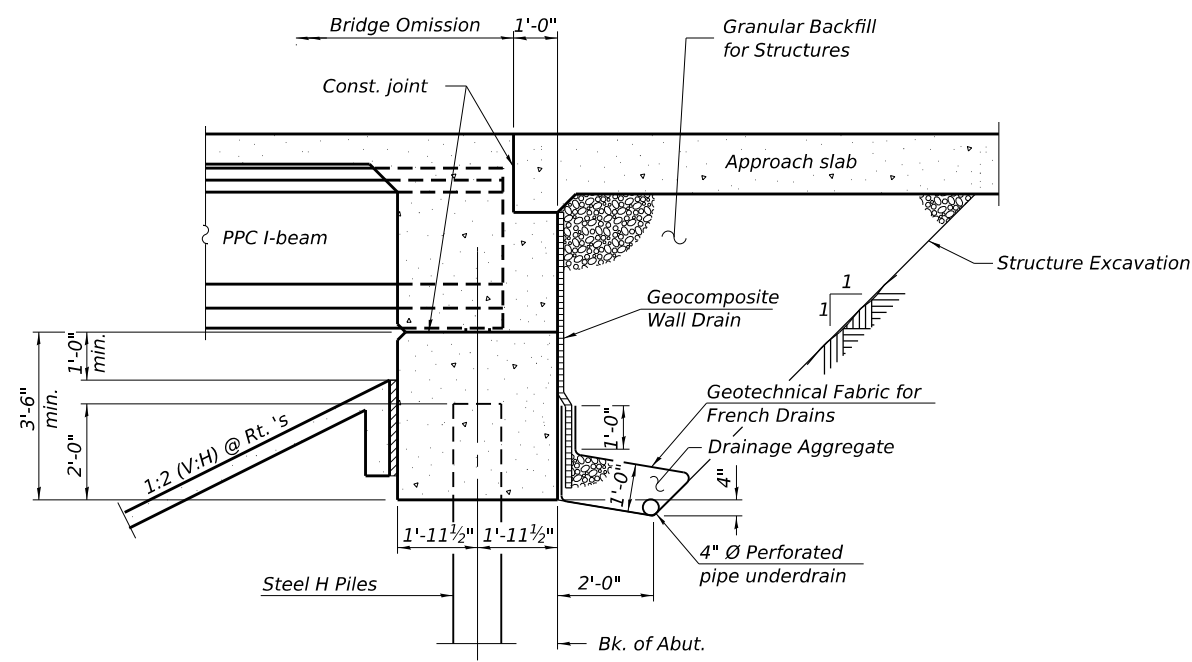




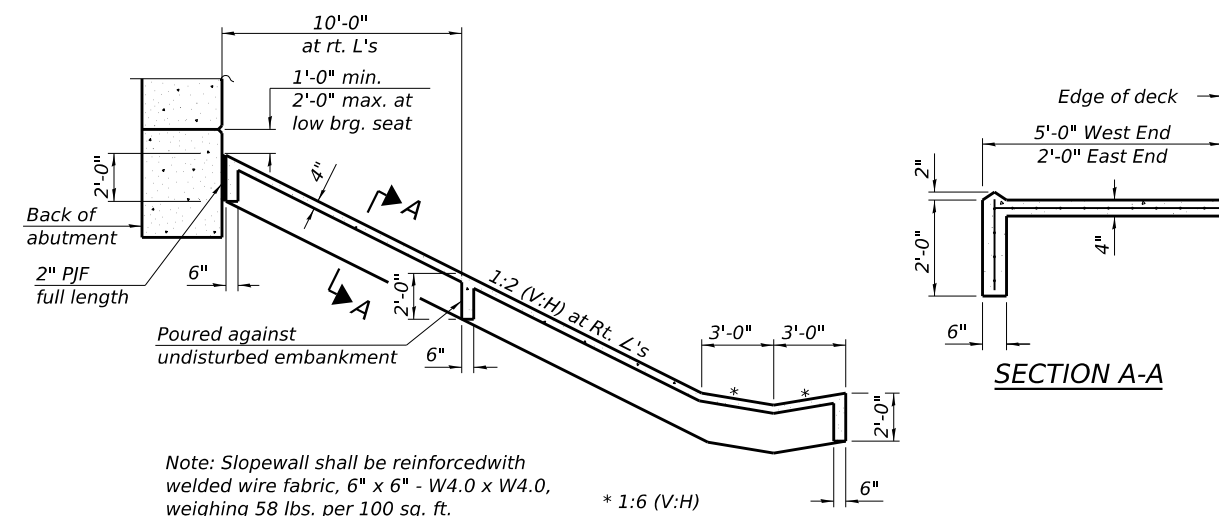
**CROSS SECTION**  
(Looking North)



**PIER SKETCH**



**SECTION THRU INTEGRAL ABUTMENT**  
(Horiz. dim. @ Rt. L's)



Note: Slope wall shall be reinforced with welded wire fabric, 6" x 6" - W4.0 x W4.0, weighing 58 lbs. per 100 sq. ft.

**SECTION THRU CONCRETE SLOPEWALL**

**SECTION A-A**

**DETAILS**  
**BRIGGS ST. OVER I-80**  
**F.A.U. ROUTE 363 - SEC.**  
**WILL COUNTY**  
**STA. 60+10.96**  
**STRUCTURE NO. 099-8307**

MODEL: Default  
FILE NAME: p:\transys\transys\corp\pw1\hosted\Documents\Projects\_2018\CH401\401180022\04-EXP\CAD\ML-02\04-Sheets\08-Structural\TSL\0998307-ML02-TSL-002.dgn



USER NAME =	DESIGNED - BAR	REVISED -
CHECKED - VCP	REVISIONS -	
PLOT SCALE =	DRAWN - BAR	REVISED -
PLOT DATE =	CHECKED - VCP	REVISED -

**STATE OF ILLINOIS**  
**DEPARTMENT OF TRANSPORTATION**

SHEET 2 OF 2 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
363		WILL		
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

**APPENDIX I**

**ISGS COAL MINES AND UNDERGROUND**

**INDUSTRIAL MINES MAP**

**WILL COUNTY**



